Yahoo Group Archive: spectrumanalyzer (2011)

Yahoo Group summary: Spectrum Analyzer Projects

These Yahoo Groups messages were archived in WARC format by ArchiveTeam in 2017. This PDF was generated by Digital Library of Amateur Radio & Communications from the WARC files in 2026.

Date span: 2011-01-01 through 2011-12-31

Source WARC: spectrumanalyzer.elhy3j4.warc.gz

Source item: https://archive.org/details/yahoo-groups-2017-05-16T13-15-56Z-d35390

Messages included in this PDF: 1744

Yahoo replaced the domain portions of email addresses with @... in the archived messages. Characters lost in Yahoo's archived text appear as ?.

Messages are presented in ascending Yahoo message-ID order. Gaps indicate records absent from the source WARC or messages omitted from this PDF as spam.

7375. Improved 2G and 3G bands

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-01 22:00:24 UTC
From: Mark Burgin
Topic: 7375 Message: 7375
Attachments: 1 described; binary payloads are missing from this source WARC

Hi Everyone
I fully understand that the original design for the MSA had a 1GHz frequency limit and that the 2G and 3G bands were added on later "for free" just by some clever changes to the software and adjustments to the circuit topology. As such, it is to be expected that there are some small deficiencies with the operation of these bands, In particular, there are images at 21.4GHz offset in the 2G band, and the 3G band has a large spur at 2026.6MHz.
Please don't think I am being critical in any way of the design of the MSA since I appreciate that one of the key design goals was to make the device as cheap as possible while still achieving sufficent degree of usefulness. It does this admirably.
However, I wondered what would be needed to change the existing design so that it had "proper" 2G, 3G, and perhaps higher, bands. What I mean by "proper" is bands which have the same quality as the 1G band. ie freedom from large spurs and images. Has anyone given this any thought?
I am very inexperienced at RF design, but, for what it's worth, and to start off a discussion, here are my ideas (WHICH MIGHT BE UTTER RUBBISH, SO PLEASE DON'T MISTAKE ANY OF THE FOLLOWING FOR A GOOD DESIGN SUGGESTION).
My understanding is that the basic problem with the 3G band is that the 1st IF lies within the range of required LO frequencies and so leakage through the mixer when the LO is at 1013.3MHz causes the large spur. In the 2G band, the problem is that the 1st IF is too low (10.7MHz) which makes it impossible to separate the frequencies of interest from their image frequencies. In both cases, a different 1st IF would alleviate the problem.
A first IF which is just below 1GHz would cure both of these issues, however, the 1G band requires that the 1st IF is above 1GHz, otherwise an input signal which happens to be at the same frequency as the 1st IF would leak through the mixer and cause noise across the whole spectrum. It looks, therefore, that two different 1st IFs are required to support the three bands, but since the cavity filter is tuned to the 1013.3MHz, an additional cavity filter would be necessary along with the associated swiching arrangements. The cavity filter is bulky, time-consuming to make and quite expensive unless you happen to have all the materials to hand and so I wanted to avoid having to include another one in the system.
I wondered about the possiblilty of adding another mixer and PLO in front of MIXER 1 in the current design to create a new 1st IF (I call it IF0 from here on) that can be swicthed between a frequency just above 1GHz and just below 1GHz depending on the band. The exisiting MIXER 1 could then be used to convert either of the two different IF0 frequencies to 1013.3MHz as normal. I have attempted to show the arrangement in the attached pdf file (I hope my attachment works!).
For the 2G band, IF0 is set to 986.7MHz and the new PLO, PLO0 is swept from 1986.7MHz to 2986.7MHz. I appreciate that this is outside the capabilites of the current PLO and so a new design would be required. PLO1 (exisiting) is set to a fixed frequency of 2000MHz) which will convert IF0 to 1013.3MHz.
For the 3G band, IF0 is also set to 986.7MHz with its PLO swept from 1013.3MHz to 2013.3MHz. This can be done by the exisiting PLO1 design.
For the 1G band, two possibilities exist. PLO1 is not really needed for this mode since the new PLO0 could sweep from 1013.3MHz to 2013.3MHz so that the output from MIXER0 (the new mixer) could feed into the cavity filter directly. However, this would require some signal

switching to bypass MIXER1 when the 1G mode is selected. An alternative would be to sweep LO0 from 1018.7MHz to 2018.7MHz, creating an IF0 of 1018.7MHz. If PLO1 is set to 2032MHz, MIXER1 will output the required 1013.3MHz without any switching being required. I also considered making IF0 1013.3MHz in this band, with LO1 set to 2026.6 MHz, this also gives 1013.3MHz at the output of MIXER1 but I am not sure that I understand the mixing process well enough to be sure that all would work OK when the RF signal and IF signal are at the same frequency and the LO is at twice that frequency. Note that if the PLO1 frequencies shown are chosen (multiples of 4MHz), I think PLO1 could be driven from the 64MHz clock, freeing up DDS1 to be used to drive the new PLO0.
What are the difficulties with this arrangement? Well, I can see a few and I am sure there are many others that I can't see.

* Addional cost. Is it worth it for the small (hoped for) benefits? Probably not, but I am a bit of a purist. What if I want to look at a signal near 2026.6MHz? What if I want to look at a signal in the 2G band that is 21.4MHz above another signal? I know! How likely is that?

* In all modes there is an extra mixing stage introducing more phase noise and conversion loss. Will this be much of a problem? Since PLO1 does not need to sweep in frequency in this arrangement, I presume that it could be changed to improve its phase noise.

* The software would need to be changed extensively to support this arrangement.

* PLO0 needs to have a range from 1GHz to 3GHz. I don't think this can be achieved with a single VCO. Could anything be done to utilise the second harmonic of the 1GHz to 2GHz PLO in order to support the 2G range? Perhaps two VCOs could be used with some means of switching between them. Is switching the LOs any easier that swicthing in the direct signal path? Perhaps the LO that is not used can be powered down so that the switch's isolation is less of an issue.

* Does the ADE-11 mixer perform adeqately with a 3GHz LO signal?

* Are there better ways of accomplishng the same thing.
Comments anyone? Please feel free to shoot me down in flames.
Mark

7376. Re: [spectrumanalyzer] Improved 2G and 3G bands [1 Attachment]

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-02 02:10:23 UTC
From: william sprowls
Topic: 7375 Message: 7376

Hi Mark,
Nothing is ever Utter Rubbish, so don't hesitate to bring up new ideas. The MSA is an on-going, ever changing project. You have several good questions, and I would like to take a fair amount of time to think about them before throwing out quick answers. But I'll answer one quickie now.
 The ADE-11X should work quite well at 3 GHz on its LO and RF ports. Its IF port is the one that gets lousy above about 1100 MHz. Mixer 1 could be "flipped" so that its R port is used as the input to the MSA and its I port is sent to the Cavity Filter (or Mixer 2 during 2G). This arrangement would work quite well for .5 GHz to 3 GHz inputs.
 Other folks can comment on your suggestions while I mull them over.
Scotty

--- On Sat, 1/1/11, Mark Burgin <mark@...> wrote:

From: Mark Burgin <mark@...>
Subject: [spectrumanalyzer] Improved 2G and 3G bands [1 Attachment]
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Saturday, January 1, 2011, 4:00 PM

[Attachment(s) from Mark Burgin included below]

Hi EveryoneI fully understand that the original design for the MSA had a 1GHz frequency limit and that the 2G and 3G bands were added on later "for free" just by some clever changes to the software and adjustments to the circuit topology. As such, it is to be expected that there are some small deficiencies with the operation of these bands, In particular, there are images at 21.4GHz offset in the 2G band, and the 3G band has a large spur at 2026.6MHz. Please don't think I am being critical in any way of the design of the MSA since I appreciate that one of the key design goals was to make the device as cheap as possible while still achieving sufficent degree of usefulness. It does this admirably.However, I wondered what would be needed to change the existing design so that it had "proper" 2G, 3G, and perhaps higher, bands. What I mean by "proper" is bands which have the same quality as the 1G band. ie freedom from large spurs and images. Has anyone given this any thought?I am very inexperienced at RF design, but, for what it's worth, and to start off a discussion, here are my ideas (WHICH MIGHT BE UTTER RUBBISH, SO PLEASE DON'T MISTAKE ANY OF THE FOLLOWING FOR A GOOD DESIGN SUGGESTION). My understanding is that the basic problem with the 3G band is that the 1st IF lies within the range of required LO frequencies and so leakage through the mixer when the LO is at 1013.3MHz causes the large spur. In the 2G band, the problem is that the 1st IF is too low (10.7MHz) which makes it impossible to separate the frequencies of interest from their image frequencies. In both cases, a different 1st IF would alleviate the problem. A first IF which is just below 1GHz would cure both of these issues, however, the 1G band requires that the 1st IF is above 1GHz, otherwise an input signal which happens to be at the same frequency as the 1st IF would leak through the mixer and cause noise across the whole spectrum. It looks, therefore, that two different 1st IFs are required to support the three bands, but since the cavity filter is tuned to the 1013.3MHz, an additional cavity filter would be necessary along with the associated swiching

arrangements. The cavity filter is bulky, time-consuming to make and quite expensive unless you happen to have all the materials to hand and so I wanted to avoid having to include another one in the system.I wondered about the possiblilty of adding another mixer and PLO in front of MIXER 1 in the current design to create a new 1st IF (I call it IF0 from here on) that can be swicthed between a frequency just above 1GHz and just below 1GHz depending on the band. The exisiting MIXER 1 could then be used to convert either of the two different IF0 frequencies to 1013.3MHz as normal. I have attempted to show the arrangement in the attached pdf file (I hope my attachment works!).For the 2G band, IF0 is set to 986.7MHz and the new PLO, PLO0 is swept from 1986.7MHz to 2986.7MHz. I appreciate that this is outside the capabilites of the current PLO and so a new design would be required. PLO1 (exisiting) is set to a fixed frequency of 2000MHz) which will convert IF0 to 1013.3MHz.For the 3G band, IF0 is also set to 986.7MHz with its PLO swept from 1013.3MHz to 2013.3MHz. This can be done by the exisiting PLO1 design.For the 1G band, two possibilities exist. PLO1 is not really needed for this mode since the new PLO0 could sweep from 1013.3MHz to 2013.3MHz so that the output from MIXER0 (the new mixer) could feed into the cavity filter directly. However, this would require some signal switching to bypass MIXER1 when the 1G mode is selected. An alternative would be to sweep LO0 from 1018.7MHz to 2018.7MHz, creating an IF0 of 1018.7MHz. If PLO1 is set to 2032MHz, MIXER1 will output the required 1013.3MHz without any switching being required. I also considered making IF0 1013.3MHz in this band, with LO1 set to 2026.6 MHz, this also gives 1013.3MHz at the output of MIXER1 but I am not sure that I understand the mixing process well enough to be sure that all would work OK when the RF signal and IF signal are at the same frequency and the LO is at twice that frequency. Note that if the PLO1 frequencies shown are chosen (multiples of 4MHz), I think PLO1 could be driven from the 64MHz clock, freeing up DDS1 to be used to drive the new PLO0.What are the difficulties with this arrangement? Well, I can see a few and I am sure there are many others that I can't see.· Addional cost. Is it worth it for the small (hoped for) benefits? Probably not, but I am a bit of a purist. What if I want to look at a signal near 2026.6MHz? What if I want to look at a signal in the 2G band that is 21.4MHz above another signal? I know! How likely is that?· In all modes there is an extra mixing stage introducing more phase noise and conversion loss. Will this be much of a problem? Since PLO1 does not need to sweep in frequency in this arrangement, I presume that it could be changed to improve its phase noise. · The software would need to be changed extensively to support this arrangement.· PLO0 needs to have a range from 1GHz to 3GHz. I don't think this can be achieved with a single VCO. Could anything be done to utilise the second harmonic of the 1GHz to 2GHz PLO in order to support the 2G range? Perhaps two VCOs could be used with some means of switching between them. Is switching the LOs any easier that swicthing in the direct signal path? Perhaps the LO that is not used can be powered down so that the switch's isolation is less of an issue.· Does the ADE-11 mixer perform adeqately with a 3GHz LO signal?· Are there better ways of accomplishng the same thing.Comments anyone? Please feel free to shoot me down in flames.Mark

7377. AD8099 IF amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-02 02:39:00 UTC
From: davidhooau
Topic: 7377 Message: 7377

Sam,

In your excellent ExpandedLogDetector2.pdf, and in your own MSA, you have used a 20dB IF2 amp with an AD8099. Do you have a schematic and PCB design available?

Many thanks,

davidh

7378. Wanted set of MSA Slim boards

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-02 14:51:10 UTC
From: Dale
Topic: 7378 Message: 7378

I saw the message from Bob that he does not have any more boards available.

Does anyone have a set of circuit boards for sale?

Are there any plans for another run of boards?

Thanks,

Dale / KB9JJA

7379. Re: AD8099 IF amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-02 18:38:41 UTC
From: Sam
Topic: 7377 Message: 7379

I did build an AD8099 amp, which I chose because of excellent distortion performance. But I ended up going with the OPA847 with gain of about 28 dB. With op amps, you lose 6 dB from the voltage gain of the op amp itself, because of the series output resistor used to give a 50 ohm output. So the op amp itself needs V/V gain of over 30, which the OPA847 can do. It also has very low distortion.

I put the files at
<http://www.wetterlin.org/sam/SA/ExpandedLogDetect/IF2Amp_OPA847.zip>

You could also use the standard IF Amp, if you have already built it. Just put an attenuator between its two sections in order to reduce the total gain.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Sam,
>
> In your excellent ExpandedLogDetector2.pdf, and in your own MSA, you have used a 20dB IF2 amp with an AD8099. Do you have a schematic and PCB design available?
>
> Many thanks,
>
> davidh
>

7380. Weird Crash--Don't use Desktop for Files

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-02 18:50:53 UTC
From: Sam
Topic: 7380 Message: 7380

I have narrowed down the cause of an occasional weird crash that I previously reported could occur when saving graph images. The crash occurs while the file dialog is open, if you hover over a file icon so as to open its tool tip. The first time through the dialog, there is no problem. The second time, you may crash (protection violation).

It took me a while to make the connection with tool tips. I was never intentionally trying to open tool tips; I would usually be thinking about what I wanted to do and would just happen to move the mouse over a file while thinking.

After considerable experimentation, and a lot of crashes, it appears to me that this crash only occurs when the target files (the ones you hover over) are on the desktop. That's where I would usually save image files and certain other files. It turns out that if you create a folder on the desktop and store the files in there, the crash does not occur. So I recommend not saving files directly on the desktop.

This crash occurs in both Win2000 and XP, and it turns out that it has been reported on the internet in other contexts, so it apparently is not a Liberty Basic issue. If all else fails, the ultimate solution would be to turn off tool tips.

Sam W.

7381. Re: Improved 2G and 3G bands [1 Attachment]

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-02 19:21:28 UTC
From: Sam
Topic: 7375 Message: 7381

There are a lot of good ideas in there. Whether it is worth the trouble depends on how much time you would spend in 2G and 3G. That one spur in 3G is not much of an issue unless you care about that specific frequency. The ghost images in 2G SA mode are OK if you look at narrow frequency ranges, though I suppose they would be irritating if you did a lot of 2G work.

Here's a possible alternative: I have an amplified LO3 output to use as the TG signal in 2G mode. It also is strong enough to be the LO of a mixer. In SA mode you don't need LO3, so you could use it to down-convert the target signals. For example, set it to 1 GHz to down-convert the 1-2 GHz range to 0-1GHz. Set it to 2GHz to down-convert the 2-3 GHz range to 0-1 GHz. Some filtering would also be required. You could even use this approach with 3-4 GHz, and higher by using harmonic mixing. All it takes is an external mixer with the appropriate frequency range. Low-pass filter the mixer output and run it into the MSA. The MSA would then operate as usual, but what it displays as 50 MHz would actually be 1050 MHz, or whatever.

You can create front-end compensation files for SA mode, which you would use to compensate for the frequency response of the down-converting mixer.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Mark,
> Nothing is ever Utter Rubbish, so don't hesitate to bring up new ideas. The MSA is an on-going, ever changing project. You have several good questions, and I would like to take a fair amount of time to think about them before throwing out quick answers. But I'll answer one quickie now.
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> Â Other folks can comment on your suggestions while I mull them over.
> Scotty
>
> --- On Sat, 1/1/11, Mark Burgin <mark@...> wrote:
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> From: Mark Burgin <mark@...>
> Subject: [spectrumanalyzer] Improved 2G and 3G bands [1 Attachment]
> To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
> Date: Saturday, January 1, 2011, 4:00 PM
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would be required.Â PLO1 (exisiting) is set to a fixed frequency of 2000MHz) which will convert IF0 to 1013.3MHz.For the 3G band, IF0 is also set to 986.7MHz with its PLO swept from 1013.3MHz to 2013.3MHz.Â This can be done by the exisiting PLO1 design.For the 1G band, two possibilities exist.Â PLO1 is not really needed for this mode since the new PLO0 could sweep from 1013.3MHz to 2013.3MHz so that the output from MIXER0 (the new mixer) could feed into the cavity filter directly.Â However, this would require some signal switching to bypass MIXER1 when the 1G mode is selected.Â An alternative would be to sweep LO0 from 1018.7MHz to 2018.7MHz, creating an IF0 of 1018.7MHz.Â If PLO1 is set to 2032MHz, MIXER1 will output the required 1013.3MHz without any switching being required.Â I
> also considered making IF0 1013.3MHz in this band, with LO1 set to 2026.6 MHz, this also gives 1013.3MHz at the output of MIXER1 butÂ I am not sure that I understand the mixing process well enough to be sure that all would work OK when the RF signal and IF signal are at the same frequency and the LO is at twice that frequency.Â Note that if the PLO1 frequencies shown are chosen (multiples of 4MHz), I think PLO1 could be driven from the 64MHz clock, freeing up DDS1 to be used to drive the new PLO0.What are the difficulties with this arrangement?Â Well, I can see a few and I am sure there are many others that I can't see.Â·Â Â Â Â Â Â Â Â Addional cost.Â Is it worth it for the small (hoped for) benefits?Â Probably not, but I am a bit of a purist.Â What if I want to look at a signal near 2026.6MHz? Â What if I want to look at a signal in the 2G band that is 21.4MHz above another signal?Â I know! How likely is that?Â·Â Â Â Â Â Â Â Â In all modes
> there is an extra mixing stage introducing more phase noise and conversion loss.Â Will this be much of a problem?Â Since PLO1 does not need to sweep in frequency in this arrangement, I presume that it could be changed to improve its phase noise.
Â·Â Â Â Â Â Â Â Â The software would need to be changed extensively to support this arrangement.Â·Â Â Â Â Â Â Â Â PLO0 needs to have a range from 1GHz to 3GHz.Â I don't think this can be achieved with a single VCO.Â Could anything be done to utilise the second harmonic of the 1GHz to 2GHz PLO in order to support the 2G range? Â Â Perhaps two VCOs could be used with some means of switching between them.Â Is switching the LOs any easier that swicthing in the direct signal path?Â Perhaps the LO that is not used can be powered down so that the switch's isolation is less of an issue.Â·Â Â Â Â Â Â Â Â Does the ADE-11 mixer perform adeqately with a 3GHz LO signal?Â·Â Â Â Â Â Â Â Â Are there better ways of
> accomplishng the same thing.Comments anyone?Â Please feel free to shoot me down in flames.Mark Â Â
>

7382. Re: AD8099 IF amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-02 19:34:34 UTC
From: Neal
Topic: 7377 Message: 7382

Sam,

In looking at your Pre RBW Filter Amp schematic, I have a curiosity question. What is the function of the 15 ohm resistor on the non inverting input to the OPA847?

Neal

7383. AT5011

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-02 20:07:21 UTC
From: Karl
Topic: 7383 Message: 7383

I see some post about the Atten Spectrum Analyzer AT5011.

and I see by the Specs that it was a display of 4 1/2 digits.

ex: 450.1, 450.2 and so on ... has anyone used an RF sampler and a Freq counter to get a finer tuning

ex: 450.1125, 450.2225 and so on

karl n2rld

7384. Re: [spectrumanalyzer] AT5011

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-02 20:18:29 UTC
From: Dan Andersson
Topic: 7383 Message: 7384

On Sunday 02 January 2011 20:07:21 you wrote:
> I see some post about the Atten Spectrum Analyzer AT5011.
>
> and I see by the Specs that it was a display of 4 1/2 digits.
>
> ex: 450.1, 450.2 and so on ... has anyone used an RF sampler and a Freq
> counter to get a finer tuning
>
> ex: 450.1125, 450.2225 and so on
>
> karl n2rld

The 5011 neeeds a climate controlled environment to be stable. It's an
obsolete design now - look for 6011.

If you czan find one cheap - fine but...

//Dan, M0DFI

7385. Re: Wanted set of MSA Slim boards

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-02 18:51:40 UTC
From: pzerkel
Topic: 7378 Message: 7385

I do not have a complete set of boards available.

If interested, I do have two of the "Control Panel Miniboards". These include only the control board, the ADC, and the LD-8306 boards. They are Rev C 3-14-2010.

I paid $60.85 for three of them, I used one, and have two extras. I would like to get $15 each (I will ship USPS 1st class to the continental U.S. for that. Other locales, actual shipping charges would apply. E-mail me if interested.

It is likely that I may soon also have a couple extra of the LO2 miniboard (PLO, IF Amp, MCF, MXR, MO),

Info on the MSA "Miniboards" is at http://www.scottyspectrumanalyzer.com/msaexpress.html

I chose the miniboard service for a couple reasons. 1) there is less "slicing and dicing" than there would have been with a full panel. 2)By doing one mini-board at a time, it is not quite as intimidating as looking at one empty "full panel"

-Paul

--- In spectrumanalyzer@yahoogroups.com, "Dale" <kb9jja@...> wrote:
>
> I saw the message from Bob that he does not have any more boards available.
>
> Does anyone have a set of circuit boards for sale?
>
> Are there any plans for another run of boards?
>
>
> Thanks,
>
> Dale / KB9JJA
>

7386. RE: [spectrumanalyzer] Re: Improved 2G and 3G bands

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-02 22:18:47 UTC
From: Mark Burgin
Topic: 7375 Message: 7386

Hi Sam

Thanks for the comments. I certainly take you point about whether or not it is worth the trouble. To be honest, I am exploring this more out of academic interest than through a real need to improve the performance for a practical purpose. The current MSA design is already good enough for 99.9% of all uses.

Your idea is certainly much simpler than mine, doesn't need many software changes and can easily be extended to higher frequencies. In fact, I considered the kind of arrangement you suggest but discounted it because I believe that there might be an image rejection issue.

When set to the 2G band (new LO of 1GHz), input signals just above 1GHz would have an image frequency that is just below 1GHz and so difficult to filter out. Of course, frequencies higher in the band will have images that are further and further away from the signal of interest. However, it would not be practical to provide filtering on the input that rejects the unwanted image frequencies across the whole 2G band but at least the image frequencies are always out-of-band so you won't see images of in-band signals.

In the scheme I described in my original post, I attempted to ensure that the unwanted image frequencies are always around 2GHz away from the signals of interest (since IF0 is always approx. 1GHz) resulting in a nearly 1GHz wide window in which an input filter could do its stuff. Whether or not the image frequency issue is important depends on what the signals are that you are looking at. If you know that there are no signals present in the image frequency range then everything works fine. On the other hand, if you are looking at a signal from an antenna, for example, then you can be less certain that you know what you are looking at if there is an un-rejected image frequency range.

I know I am being a perfectionist again and that's not really what the MSA is about, but I am curious to know how perfect it can be made to be.

Mark

From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of Sam
Sent: 02 January 2011 19:21
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Re: Improved 2G and 3G bands

There are a lot of good ideas in there. Whether it is worth the trouble depends on how much time you would spend in 2G and 3G. That one spur in 3G is not much of an issue unless you care about that specific frequency. The ghost images in 2G SA mode are OK if you look at narrow frequency ranges, though I suppose they would be irritating if you did a lot of 2G work.

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down-convert the 1-2 GHz range to 0-1GHz. Set it to 2GHz to down-convert the 2-3 GHz range to 0-1 GHz. Some filtering would also be required. You could even use this approach with 3-4 GHz, and higher by using harmonic mixing. All it takes is an external mixer with the appropriate frequency range. Low-pass filter the mixer output and run it into the MSA. The MSA would then operate as usual, but what it displays as 50 MHz would actually be 1050 MHz, or whatever.

You can create front-end compensation files for SA mode, which you would use to compensate for the frequency response of the down-converting mixer.

Sam W.

--- In spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>, william sprowls <wsprowls@...> wrote:
>
> Hi Mark,
> Nothing is ever Utter Rubbish, so don't hesitate to bring up new ideas. The MSA is an on-going, ever changing project. You have several good questions, and I would like to take a fair amount of time to think about them before throwing out quick answers. But I'll answer one quickie now.
> Â The ADE-11X should work quite well at 3 GHz on its LO and RF ports. Its IF port is the one that gets lousy above about 1100 MHz. Mixer 1 could be "flipped" so that its R port is used as the input to the MSA and its I port is sent to the Cavity Filter (or Mixer 2 during 2G). This arrangement would work quite well for .5 GHz to 3 GHz inputs.
> Â Other folks can comment on your suggestions while I mull them over.
> Scotty
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> --- On Sat, 1/1/11, Mark Burgin <mark@...> wrote:
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> Subject: [spectrumanalyzer] Improved 2G and 3G bands [1 Attachment]
> To: "spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>" <spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>>
> Date: Saturday, January 1, 2011, 4:00 PM
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> images.Â Has anyone given this any thought?I am very inexperienced at RF design, but, for what it's worth, and to start off a discussion, here are my ideas (WHICH MIGHT BE UTTER RUBBISH, SO PLEASE DON'T MISTAKE ANY OF THE FOLLOWING FOR A GOOD DESIGN SUGGESTION).Â My understanding is that the basic problem with the 3G band is that the 1st IF lies within the range of required LO frequencies and so leakage through the mixer when the LO is at 1013.3MHz causes the large spur.Â In the 2G band, the problem is that the 1st IF is too low (10.7MHz) which makes it impossible to separate the frequencies of interest from their image frequencies.Â In both cases, a different 1st IF would alleviate the problem.Â A first IF which is just below 1GHz would cure both of these issues, however, the 1G band requires that the 1st IF is above 1GHz, otherwise an input signal which happens to be at the same frequency as the 1st IF would leak through the mixer and cause noise
> across the whole spectrum.Â It looks, therefore, that two different 1st IFs are required to support the three bands, but since the cavity filter is tuned to the 1013.3MHz, an additional cavity filter would be necessary along with the associated swiching arrangements.Â The cavity filter is bulky, time-consuming to make and quite expensive unless you happen to have all the materials to hand and so I wanted to avoid having to include another one in the system.I wondered about the possiblilty of adding another mixer and PLO in front of MIXER 1 in the current design to create a new 1st IF (I call it IF0 from here on) that can be swicthed between a frequency just above 1GHz and just below 1GHz depending on the band.Â The exisiting MIXER 1 could then be used to convert either of the two different IF0 frequencies to 1013.3MHz as normal.Â I have attempted to show the arrangement in the attached pdf file (I hope my attachment works!).For the 2G band, IF0 is
> set to 986.7MHz and the new PLO, PLO0 is swept from 1986.7MHz to 2986.7MHz.Â I appreciate that this is outside the capabilites of the current PLO and so a new design would be required.Â PLO1 (exisiting) is set to a fixed frequency of 2000MHz) which will convert IF0 to 1013.3MHz.For the 3G band, IF0 is also set to 986.7MHz with its PLO swept from 1013.3MHz to 2013.3MHz.Â This can be done by the exisiting PLO1 design.For the 1G band, two possibilities exist.Â PLO1 is not really needed for this mode since the new PLO0 could sweep from 1013.3MHz to 2013.3MHz so that the output from MIXER0 (the new mixer) could feed into the cavity filter directly.Â However, this would require some signal switching to bypass MIXER1 when the 1G mode is selected.Â An alternative would be to sweep LO0 from 1018.7MHz to 2018.7MHz, creating an IF0 of 1018.7MHz.Â If PLO1 is set to 2032MHz, MIXER1 will output the required 1013.3MHz without any switching being required.Â I
> also considered making IF0 1013.3MHz in this band, with LO1 set to 2026.6 MHz, this also gives 1013.3MHz at the output of MIXER1 butÂ I am not sure that I understand the mixing process well enough to be sure that all would work OK when the RF signal and IF signal are at the same frequency and the LO is at twice that frequency.Â Note that if the PLO1

frequencies shown are chosen (multiples of 4MHz), I think PLO1 could be driven from the 64MHz clock, freeing up DDS1 to be used to drive the new PLO0.What are the difficulties with this arrangement?Â Well, I can see a few and I am sure there are many others that I can't see.Â·Â Â Â Â Â Â Â Â Addional cost.Â Is it worth it for the small (hoped for) benefits?Â Probably not, but I am a bit of a purist.Â What if I want to look at a signal near 2026.6MHz? Â What if I want to look at a signal in the 2G band that is 21.4MHz above another signal?Â I know! How likely is that?Â·Â Â Â Â Â Â Â Â In all modes
> there is an extra mixing stage introducing more phase noise and conversion loss.Â Will this be much of a problem?Â Since PLO1 does not need to sweep in frequency in this arrangement, I presume that it could be changed to improve its phase noise. Â·Â Â Â Â Â Â Â Â The software would need to be changed extensively to support this arrangement.Â·Â Â Â Â Â Â Â Â Â PLO0 needs to have a range from 1GHz to 3GHz.Â I don't think this can be achieved with a single VCO.Â Could anything be done to utilise the second harmonic of the 1GHz to 2GHz PLO in order to support the 2G range? Â Â Perhaps two VCOs could be used with some means of switching between them.Â Is switching the LOs any easier that swicthing in the direct signal path?Â Perhaps the LO that is not used can be powered down so that the switch's isolation is less of an issue.Â·Â Â Â Â Â Â Â Â Does the ADE-11 mixer perform adeqately with a 3GHz LO signal?Â·Â Â Â Â Â Â Â Â Are there better ways of
> accomplishng the same thing.Comments anyone?Â Please feel free to shoot me down in flames.Mark Â Â
>

7387. Re: AD8099 IF amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-02 23:03:31 UTC
From: Sam
Topic: 7377 Message: 7387

Neal,
Without the resistor, the impedance seen from the non-inverting input would be two parallel 50 ohm resistances, or 25 ohms. The 15 ohm resistor increases this to 40 ohms. Some high frequency op amps will oscillate if the non-inverting input sees an impedance far from 50 ohms. I believe the 15 ohm resistor was actually necessary on the AD8099 design to prevent oscillation. I think my OPA847 design simply inherited the resistor; it may not actually be necessary.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Neal" <nealmartini@...> wrote:
>
> Sam,
>
> In looking at your Pre RBW Filter Amp schematic, I have a curiosity question. What is the function of the 15 ohm resistor on the non inverting input to the OPA847?
>
>
> Neal
>

7388. Re: Improved 2G and 3G bands

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-03 00:06:46 UTC
From: Sam
Topic: 7375 Message: 7388

I cheated a bit on my explanation of using LO3 to down-convert signals. I made the statement that some filtering would also be required. That filtering would actually require perfect brick walls if you create bands of 1 GHz each. In reality, you would need to make the bands a little smaller. For example, the base SA could run from LF to 1 GHz with no down-conversion. The next band could start with LO3=950 MHz (I think it will go that low with no problem.) That would show 1 GHz as 50 MHz, and 1950 MHz as 1 GHz. The LO3 of 950 MHz would also show 900 MHz as 50 MHz, so you need to filter that out. That means you have to filter out 900 MHz and below but pass 1 GHz and above, which is feasible. This makes the "2G" band run from 1 GHz to 1950 MHz, which you would display by setting the sweep from 50 MHz to 1 GHz.

(Having the lowest signal of the band show at 50 MHz also has the advantage that your high frequency down-converting mixer may well not like its IF to operate down to a couple of MHz.)

More likely, you would have an interest in some specific frequency range, such as 1.8-2.0 GHz. You could make up your own band with the frequencies of interest near the middle. So you could set LO3=1.5 GHz, which will convert 1.8 GHz to 300 MHz, as it would also do to 1.2 GHz. Separating 1.2 GHz from 1.8 GHz would be relatively easy.

It seems likely that the bulk of SA applications above 1 GHz would involve bands-of-interest of a couple hundred MHz at most, which makes the filtering not to difficult. Sure, it sometimes would be nice to view harmonics over a broad range. But for that application, the standard MSA without extra down-conversion works fine--the 2G ghost images are easy to sort out if you have harmonics spaced at, say, 200 MHz.

I haven't thought this through, but there may be a variation of your scheme where the existing LO3, used as the LO for a pre-mixer, is swept rather than being fixed. Or maybe there is a way to simultaneously sweep LO1 and LO3 in a useful way. I am only fixated on using the existing LO3 because it simplifies things considerably--LO3 is needed for VNA modes anyway, and is already connected to the control board, and in SA mode it otherwise just sits there doing nothing (unless you are using the signal generator or tracking generator).

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Mark Burgin <mark@...> wrote:
>
> Hi Sam
>
> Thanks for the comments. I certainly take you point about whether or not it is worth the trouble. To be honest, I am exploring this more out of academic interest than through a real need to improve the performance for a practical purpose. The current MSA design is already good enough for 99.9% of all uses.
>
> Your idea is certainly much simpler than mine, doesn't need many software changes and can

easily be extended to higher frequencies. In fact, I considered the kind of arrangement you suggest but discounted it because I believe that there might be an image rejection issue.
>
> When set to the 2G band (new LO of 1GHz), input signals just above 1GHz would have an image frequency that is just below 1GHz and so difficult to filter out. Of course, frequencies higher in the band will have images that are further and further away from the signal of interest. However, it would not be practical to provide filtering on the input that rejects the unwanted image frequencies across the whole 2G band but at least the image frequencies are always out-of-band so you won't see images of in-band signals.
>
> In the scheme I described in my original post, I attempted to ensure that the unwanted image frequencies are always around 2GHz away from the signals of interest (since IF0 is always approx. 1GHz) resulting in a nearly 1GHz wide window in which an input filter could do its stuff. Whether or not the image frequency issue is important depends on what the signals are that you are looking at. If you know that there are no signals present in the image frequency range then everything works fine. On the other hand, if you are looking at a signal from an antenna, for example, then you can be less certain that you know what you are looking at if there is an un-rejected image frequency range.
>
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> > Subject: [spectrumanalyzer] Improved 2G and 3G bands [1 Attachment]
> > To: "spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>" <spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>>
> > Date: Saturday, January 1, 2011, 4:00 PM
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> >
>

7389. Version 116 beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-03 00:28:50 UTC
From: Sam
Topic: 7389 Message: 7389

I have posted the beta version of the 116 software in the files section:

<http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_version116_4b_Beta.zip>

This has a number of bug fixes plus many new features that are described in the zip file. It includes the USB interface, though there are a couple changes needed for USB to control automated switches (other than the RBW switch).

My plan is to switch back to hardware mode, and experiment with the video filter switch and other automated switches. For the most part, I don't plan to alter the software other than to fix problems.

Sam W.

7390. Re: [spectrumanalyzer] Improved 2G and 3G bands [1 Attachment]

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-03 00:34:17 UTC
From: william sprowls
Topic: 7375 Message: 7390

Hi Mark,
 After some reflection, let me respond to your comments.
Your assumptions are quite correct. For sure, both 2G and 3G MSA operations are not "proper" topology, they are "icing on the cake". The cake is 1G. For "proper" topologies, to minimize spurious, it would be best to have a stand-alone MSA for each band. Adding the Mixer 0 topology will work, but has the potential to introduce another magnitude of spurious. (Plus that added cost). In my honest opinion (and how I use an analyzer, it is not worth the cost/complexity.
 As pointed out, the 3G Band contains only a few obvious spurs (total "inop" when trying to look at an external signal at, or near 2026.6 Hz). However, I think it is a minor encumbrance when the rest of 3G is quite good. (All that icing with a small bare patch).

 2G in MSA has image frequencies completely across the band. Nobody in his right mind would design a Spectrum Analyzer with this topology. (VNA operation here is not affected). The user needs to understand that if he is looking for unknown signals, he cannot be immediately assured that a response is a normal or image signal. It would be nice for the MSA to do something automatically and say "the response you see is a normal signal" or "the response you see is an image signal". Until we (Sam and I) come up with something cool, the user can manually determine this ambiguity. Here are two ways it is done:
1. If your MSA has at least two Resolution Filters that are not the same frequency:
Example, Path 1 =10.7 MHz and Path 2 = 10.11 Mhz
a. In Path 1, you are scanning and see a signal at 1000 MHz.
b. Halt the sweep and change the sweep parameters to place the signal at the center of the graph (CF = 1000 MHz)
c. Change to Path 2 and sweep again.
d. If the signal remains in the center, it is normal signal at 1000 MHz.
e. If the signal disappears or moves, it is an image signal at 1021.4 MHz.

2. If you have only one Resolution Filter (at 10.7 MHz)
a. Go to the Hardware Configuration Manager and lie to it by adding a Path 2 at 10.701 Mhz. (1 KHz higher than your real Filter)
b. In Path 1, you are scanning and see a signal at 1000 MHz.

c. Halt the sweep and change the sweep parameters to place the signal at the center of the graph (CF = 1000 MHz)

d. Change to Path 2 and sweep again.
e. If the signal moves down in frequency by 1 KHz, it is normal signal at 1000 MHz.

f. If the signal moves up in frequency by 1 KHz, it is an image signal at 1021.4 MHz.
Sometimes it is ok to fool Mother Nature, or in this case, your MSA.
Scotty

--- On Sat, 1/1/11, Mark Burgin <mark@...> wrote:

From: Mark Burgin <mark@...>
Subject: [spectrumanalyzer] Improved 2G and 3G bands [1 Attachment]

To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Saturday, January 1, 2011, 4:00 PM

[Attachment(s) from Mark Burgin included below]

Hi EveryoneI fully understand that the original design for the MSA had a 1GHz frequency limit and that the 2G and 3G bands were added on later "for free" just by some clever changes to the software and adjustments to the circuit topology. As such, it is to be expected that there are some small deficiencies with the operation of these bands, In particular, there are images at 21.4GHz offset in the 2G band, and the 3G band has a large spur at 2026.6MHz. Please don't think I am being critical in any way of the design of the MSA since I appreciate that one of the key design goals was to make the device as cheap as possible while still achieving sufficent degree of usefulness. It does this admirably.However, I wondered what would be needed to change the existing design so that it had "proper" 2G, 3G, and perhaps higher, bands. What I mean by "proper" is bands which have the same quality as the 1G band. ie freedom from large spurs and images. Has anyone given this any thought?I am very inexperienced at RF design, but, for what it's worth, and to start off a discussion, here are my ideas (WHICH MIGHT BE UTTER RUBBISH, SO PLEASE DON'T MISTAKE ANY OF THE FOLLOWING FOR A GOOD DESIGN SUGGESTION). My understanding is that the basic problem with the 3G band is that the 1st IF lies within the range of required LO frequencies and so leakage through the mixer when the LO is at 1013.3MHz causes the large spur. In the 2G band, the problem is that the 1st IF is too low (10.7MHz) which makes it impossible to separate the frequencies of interest from their image frequencies. In both cases, a different 1st IF would alleviate the problem. A first IF which is just below 1GHz would cure both of these issues, however, the 1G band requires that the 1st IF is above 1GHz, otherwise an input signal which happens to be at the same frequency as the 1st IF would leak through the mixer and cause noise across the whole spectrum. It looks, therefore, that two different 1st IFs are required to support the three bands, but since the cavity filter is tuned to the 1013.3MHz, an additional cavity filter would be necessary along with the associated swiching arrangements. The cavity filter is bulky, time-consuming to make and quite expensive unless you happen to have all the materials to hand and so I wanted to avoid having to include another one in the system.I wondered about the possiblilty of adding another mixer and PLO in front of MIXER 1 in the current design to create a new 1st IF (I call it IF0 from here on) that can be swicthed between a frequency just above 1GHz and just below 1GHz depending on the band. The exisiting MIXER 1 could then be used to convert either of the two different IF0 frequencies to 1013.3MHz as normal. I have attempted to show the arrangement in the attached pdf file (I hope my attachment works!).For the 2G band, IF0 is set to 986.7MHz and the new PLO, PLO0 is swept from 1986.7MHz to 2986.7MHz. I appreciate that this is outside the capabilites of the current PLO and so a new design would be required. PLO1 (exisiting) is set to a fixed frequency of 2000MHz) which will convert IF0 to 1013.3MHz.For the 3G band, IF0 is also set to 986.7MHz with its PLO swept from 1013.3MHz to 2013.3MHz. This can be done by the exisiting PLO1 design.For the 1G band, two possibilities exist. PLO1 is not really needed for this mode since the new PLO0 could sweep from 1013.3MHz to 2013.3MHz so that the output from MIXER0 (the new mixer) could feed into the cavity filter directly. However, this would require some signal switching to bypass MIXER1 when the 1G mode is selected. An alternative would be to sweep LO0 from 1018.7MHz to 2018.7MHz, creating an IF0 of 1018.7MHz. If PLO1 is set to 2032MHz, MIXER1 will output the required 1013.3MHz without any switching being required. I also considered making IF0 1013.3MHz in this band, with LO1 set to 2026.6 MHz, this also gives 1013.3MHz at the output of MIXER1 but I am not sure that I understand the mixing

process well enough to be sure that all would work OK when the RF signal and IF signal are at the same frequency and the LO is at twice that frequency. Note that if the PLO1 frequencies shown are chosen (multiples of 4MHz), I think PLO1 could be driven from the 64MHz clock, freeing up DDS1 to be used to drive the new PLO0.What are the difficulties with this arrangement? Well, I can see a few and I am sure there are many others that I can't see.· Addional cost. Is it worth it for the small (hoped for) benefits? Probably not, but I am a bit of a purist. What if I want to look at a signal near 2026.6MHz? What if I want to look at a signal in the 2G band that is 21.4MHz above another signal? I know! How likely is that?· In all modes
there is an extra mixing stage introducing more phase noise and conversion loss. Will this be much of a problem? Since PLO1 does not need to sweep in frequency in this arrangement, I presume that it could be changed to improve its phase noise. · The software would need to be changed extensively to support this arrangement.· PLO0 needs to have a range from 1GHz to 3GHz. I don't think this can be achieved with a single VCO. Could anything be done to utilise the second harmonic of the 1GHz to 2GHz PLO in order to support the 2G range? Perhaps two VCOs could be used with some means of switching between them. Is switching the LOs any easier that swicthing in the direct signal path? Perhaps the LO that is not used can be powered down so that the switch's isolation is less of an issue.· Does the ADE-11 mixer perform adeqately with a 3GHz LO signal?· Are there better ways of
accomplishng the same thing.Comments anyone? Please feel free to shoot me down in flames.Mark

7391. Re: [spectrumanalyzer] Re: MSA Noise floor

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-03 02:27:55 UTC
From: Lincheng Xiu
Topic: 7157 Message: 7391

Scotty
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Regards
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From: william sprowls <wsprowls@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Fri, December 10, 2010 8:05:11 AM
Subject: Re: [spectrumanalyzer] Re: MSA Noise floor

Hi Lin,
 As you have found, shielding is very important. The MSA may be an inexpensive solution to a commercial SA, but it is just as sensitive. Stray signals and noise entering the modules are troublesome. You might relay to the group page what you have accomplished in your study of noise.
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--- On Thu, 12/9/10, inlinebeginner <inlinebeginner@yahoo.com> wrote:

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>Date: Thursday, December 9, 2010, 11:27 PM
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Date: 2011-01-03 02:41:14 UTC
From: inlinebeginner
Topic: 7157 Message: 7392

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From: william sprowls
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What I did is that put the fence and lid for mixer 1, mixer 2, IFA (my log detector was shielded before), after that the spurs were gone, and I did a coarse cal between -100dBm and -108dBm, with step of 2dB. After that it works very well.
The commercial SA I am using, if I use 1KHz RBW filter, can reach -110 to -113dBm. We are not far away from the commercial SA. With Sam's expended log detector, the noise floor at log detector input would drop to -149dBm (1Hz), and the MSA baseline, with 1kHz RBW filter, should be -149+30 = -119dBm (actually
number Sam got -120dBm baseline), which is better than the commercial SA.
Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@...> wrote:
>
> Hi Lin,
> A couple of things.
> When trying to determine the noise floor of the MSA, and you know you have potential spurs, do not make noise measurements near them.
>
> Even though the "front end" of the MSA will produce noise (mixer noise), it is well below the physical noise floor of -174 dBm, measured at the output of the Mixer 2. Your "overall gain" of the MSA is not a factor in noise floor determination. Only the gain from the input of the IF Amp to the input of the Log Detector is what is important. The IF Amp gain should be +40 dB, +/- 2 dB. The insertion loss of the Resolution bandpass filter must be subtracted to get the real gain from the input of the IF Amp to the input of the Log Detector.
> Also, I
have been using 3 dB as the Noise Figure of the IF Amp. It is probably a little less than that.
> Scotty
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Scotty
> > Thanks for your noise floor calculations. My calculation may get same result as yours, later I will explain to you.
> >
> > The noise floor I measured with a SA at RB filter output (or log detector input is around -136dBm/Hz. The reason that it is not
> > -131dBm/Hz as what you calculated is that the overall gain is only about 11dB, I need to check why the gain is so low.
> >
> > For 7.5kHz, I can see a hump, centered at 10.7MHz, its top is 136dBm/Hz, width is about +/-10kHz. Away +/-10kHz, the noise floor reach SA noise floor 143dBm/Hz.
> >
> > The problem I saw is that there is a spur right at center, about
-92dBm. I don't know if this spurs is generated in the path, or induced from other modules. I have not put fences for IFA, and MIXER1 and 2.
> > Thanks.
> > Lin
> >

> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > >
> > > Hi Lin,
> > > Your noise figure is correct, however, that is not what determines the noise floor. The noise floor is determined by the noise gain and losses in the MSA, prior to the Log Detector. The noise exiting Mixer 2 is below the physical noise floor of -174 dBm.
> > > Assume the dual IF amplifier has 40 dB of gain and 3 dB of Noise Figure. The noise entering the IF Amp is -174 dBm +3dB. The amplified noise is:
> > > -174 +3 +40= -131 dBm of noise leaving the IF Amp, in a 1 Hz bandwidth.
> > > Now assume a 1 KHz BW filter with 6.1 dB of loss. The total noise leaving the filter is:
> > > -131dBm +10log1000 -6.1 = -107.1 dBm. This is the amount of power entering the Log Detector.
> > > If your Log Detector works from -99 to +13 dBm, the -107.1 dBm noise at the Log Detector input will not be measured. Since it is 8.1 dB below the noise floor of the Log Detector, the measurement will be the floor of the Log Detector, -99 dBm. In this case, the noise floor of the MSA is the noise floor of the Log Detector.
> > >
> > > Using the 7.5 KHz filter:
> > > -131dBm +10log7500 -4.5 = -96.7 dBm. This is 2.3 dB higher than the Log Detector noise floor and will now be the noise floor of the MSA, and should be measured as -96.7.
> > >
> > > Using the 61 KHz filter:
> > > You didn't state its insertion loss, so I will use 4.5 dB, the same as the 7.5 KHz filter:
> > > -131dBm +10log61000 -4.5 = -87.6 dBm. This power level is well above the -99 dBm floor of the Log Detector and should be measured as -87.6 dBm.
> > >
> > > I suggest your measurements will be much closer once you have calibrated each path with each different filter.
> > > Scotty
> > >
> > > --- On Sat, 12/4/10, inlinebeginner <inlinebeginner@> wrote:
> > >
> > > From: inlinebeginner <inlinebeginner@>
> > > Subject: [spectrumanalyzer] Re: MSA Noise floor
> > > To: spectrumanalyzer@...m
> > > Date: Saturday, December 4, 2010, 11:11 PM
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> > > The overall noise figure from MSA input to RB filter output is about 25dB. The overall gain is about 14dB.
> > >
> > > If I use a 1kHz RB filter, the noise floor at RB filter output should be around: -174 + 25 + 14 + 30 = -105dBm. My log detector works from -99 to 13dBm, therefore, the noise floor I should see for 1kHz filter is -99dBm, limited by the log detector.
> > >
> > > If I use a 7.5kHz RB filter, the noise floor at RB filter output should be -174 + 25 + 14 + 38 = -97dBm. consider the insertion loss is 1.6 dB less than 1kHz filter, the noise floor should be -97+1.5=-94.5dB. But I got -100dB. Still could not explain why.
> > >
> > > For 61kHz, the noise floor: -174 + 25 + 14 + 47 = -88dBm, I got -96dBm, which is not right.
> > >
> > > Something might be still wrong.
> > >
> > > Lin
> >
>
> > >
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > >
> > > >
> > >
> > > > Scotty
> > >
> > > > I thought about the insertion loss. Actually, the 7.5dB RB insertion loss is 4.5dB, and 1kHz Rb has 6.1dB loss.
> > >
> > > > I did coarse cal, with a accrate signal source and SA, -10, to -90 dBm, every 10 dB. I can measure the power very close.
> > >
> > > >
> > >
> > > > I am still waiting for the ERA-33 to replace the EAR-5. Also, I need to find a 7SZ04 to see why I got 20mA. After that, I can put fence on most of the modules and finish the calibrations.
> > >
> > > > Thanks
> > >
> > > > Lin
> > >

> > > >
> > >
> > > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > >
> > > > >
> > >
> > > > > Hi Lin,
> > >
> > > > > Be sure to factor in the insertion loss of each filter. Perhaps the 7.5 KHz filter has more loss. A better reference to each other will be accurate once you have calibrated.
> > >
> > > > > Scotty
> > >
> >
>

7394. RE: [spectrumanalyzer] Improved 2G and 3G bands

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-03 11:36:40 UTC
From: Mark Burgin
Topic: 7375 Message: 7394

Scotty and Sam
I totally accept that there is very little practical reason to change anything in order to cover the "the small bare patch", and that the 21.4MHz images in 2G mode are just an inconvenience rather than a real problem. I like the idea of fiddling with the resoution filter centre frequency to determine if a signal is real or an image. For nearly all members of the group, it would not be worth the effort to change anything.
However I might still play with the ideas further myself, but without wasting any more of the group's time. Of course, if I come up with a great idea that costs no money and needs no software changes, I will report back! I'm an optimist!
Thanks very much for taking the time to respond. I appreciate that the nature of my post meant that it was not posible to dash off a quick response and that you both had to use up some of your valuable time writing your replies.
Mark

From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of william sprowls
Sent: 03 January 2011 00:34
To: spectrumanalyzer@yahoogroups.com
Subject: Re: [spectrumanalyzer] Improved 2G and 3G bands

Hi Mark,
After some reflection, let me respond to your comments.
Your assumptions are quite correct. For sure, both 2G and 3G MSA operations are not "proper" topology, they are "icing on the cake". The cake is 1G. For "proper" topologies, to minimize spurious, it would be best to have a stand-alone MSA for each band. Adding the Mixer 0 topology will work, but has the potential to introduce another magnitude of spurious. (Plus that added cost). In my honest opinion (and how I use an analyzer, it is not worth the cost/complexity.
As pointed out, the 3G Band contains only a few obvious spurs (total "inop" when trying to look at an external signal at, or near 2026.6 Hz). However, I think it is a minor encumbrance when the rest of 3G is quite good. (All that icing with a small bare patch).

2G in MSA has image frequencies completely across the band. Nobody in his right mind would design a Spectrum Analyzer with this topology. (VNA operation here is not affected). The user needs to understand that if he is looking for unknown signals, he cannot be immediately assured that a response is a normal or image signal. It would be nice for the MSA to do something automatically and say "the response you see is a normal signal" or "the response you see is an image signal". Until we (Sam and I) come up with something cool, the user can manually determine this ambiguity. Here are two ways it is done:
1. If your MSA has at least two Resolution Filters that are not the same frequency:
Example, Path 1 =10.7 MHz and Path 2 = 10.11 Mhz
a. In Path 1, you are scanning and see a signal at 1000 MHz.
b. Halt the sweep and change the sweep parameters to place the signal at the center of the graph (CF = 1000 MHz)
c. Change to Path 2 and sweep again.
d. If the signal remains in the center, it is normal signal at 1000 MHz.

e. If the signal disappears or moves, it is an image signal at 1021.4 MHz.

2. If you have only one Resolution Filter (at 10.7 MHz)
a. Go to the Hardware Configuration Manager and lie to it by adding a Path 2 at 10.701 Mhz. (1 KHz higher than your real Filter)
b. In Path 1, you are scanning and see a signal at 1000 MHz.
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e. If the signal moves down in frequency by 1 KHz, it is normal signal at 1000 MHz.
f. If the signal moves up in frequency by 1 KHz, it is an image signal at 1021.4 MHz.
Sometimes it is ok to fool Mother Nature, or in this case, your MSA.
Scotty

--- On Sat, 1/1/11, Mark Burgin <mark@mburgin.co.uk> wrote:

From: Mark Burgin <mark@...>
Subject: [spectrumanalyzer] Improved 2G and 3G bands [1 Attachment]
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Saturday, January 1, 2011, 4:00 PM

Hi Everyone

I fully understand that the original design for the MSA had a 1GHz frequency limit and that the 2G and 3G bands were added on later "for free" just by some clever changes to the software and adjustments to the circuit topology. As such, it is to be expected that there are some small deficiencies with the operation of these bands, In particular, there are images at 21.4GHz offset in the 2G band, and the 3G band has a large spur at 2026.6MHz. Please don't think I am being critical in any way of the design of the MSA since I appreciate that one of the key design goals was to make the device as cheap as possible while still achieving sufficent degree of usefulness. It does this admirably.

However, I wondered what would be needed to change the existing design so that it had "proper" 2G, 3G, and perhaps higher, bands. What I mean by "proper" is bands which have the same quality as the 1G band. ie freedom from large spurs and images. Has anyone given this any thought?

I am very inexperienced at RF design, but, for what it's worth, and to start off a discussion, here are my ideas (WHICH MIGHT BE UTTER RUBBISH, SO PLEASE DON'T MISTAKE ANY OF THE FOLLOWING FOR A GOOD DESIGN SUGGESTION).

My understanding is that the basic problem with the 3G band is that the 1st IF lies within the range of required LO frequencies and so leakage through the mixer when the LO is at 1013.3MHz causes the large spur. In the 2G band, the problem is that the 1st IF is too low (10.7MHz) which makes it impossible to separate the frequencies of interest from their image frequencies. In both cases, a different 1st IF would alleviate the problem.

A first IF which is just below 1GHz would cure both of these issues, however, the 1G band requires that the 1st IF is above 1GHz, otherwise an input signal which happens to be at the same frequency as the 1st IF would leak through the mixer and cause noise across the whole spectrum. It looks, therefore, that two different 1st IFs are required to support the three bands, but since the cavity filter is tuned to the 1013.3MHz, an additional cavity

filter would be necessary along with the associated swiching arrangements. The cavity filter is bulky, time-consuming to make and quite expensive unless you happen to have all the materials to hand and so I wanted to avoid having to include another one in the system.

I wondered about the possiblilty of adding another mixer and PLO in front of MIXER 1 in the current design to create a new 1st IF (I call it IF0 from here on) that can be swicthed between a frequency just above 1GHz and just below 1GHz depending on the band. The exisiting MIXER 1 could then be used to convert either of the two different IF0 frequencies to 1013.3MHz as normal. I have attempted to show the arrangement in the attached pdf file (I hope my attachment works!).

For the 2G band, IF0 is set to 986.7MHz and the new PLO, PLO0 is swept from 1986.7MHz to 2986.7MHz. I appreciate that this is outside the capabilites of the current PLO and so a new design would be required. PLO1 (exisiting) is set to a fixed frequency of 2000MHz) which will convert IF0 to 1013.3MHz.

For the 3G band, IF0 is also set to 986.7MHz with its PLO swept from 1013.3MHz to 2013.3MHz. This can be done by the exisiting PLO1 design.

For the 1G band, two possibilities exist. PLO1 is not really needed for this mode since the new PLO0 could sweep from 1013.3MHz to 2013.3MHz so that the output from MIXER0 (the new mixer) could feed into the cavity filter directly. However, this would require some signal switching to bypass MIXER1 when the 1G mode is selected. An alternative would be to sweep LO0 from 1018.7MHz to 2018.7MHz, creating an IF0 of 1018.7MHz. If PLO1 is set to 2032MHz, MIXER1 will output the required 1013.3MHz without any switching being required. I also considered making IF0 1013.3MHz in this band, with LO1 set to 2026.6 MHz, this also gives 1013.3MHz at the output of MIXER1 but I am not sure that I understand the mixing process well enough to be sure that all would work OK when the RF signal and IF signal are at the same frequency and the LO is at twice that frequency. Note that if the PLO1 frequencies shown are chosen (multiples of 4MHz), I think PLO1 could be driven from the 64MHz clock, freeing up DDS1 to be used to drive the new PLO0.

What are the difficulties with this arrangement? Well, I can see a few and I am sure there are many others that I can't see.

* Addional cost. Is it worth it for the small (hoped for) benefits? Probably not, but I am a bit of a purist. What if I want to look at a signal near 2026.6MHz? What if I want to look at a signal in the 2G band that is 21.4MHz above another signal? I know! How likely is that?

* In all modes there is an extra mixing stage introducing more phase noise and conversion loss. Will this be much of a problem? Since PLO1 does not need to sweep in frequency in this arrangement, I presume that it could be changed to improve its phase noise.

* The software would need to be changed extensively to support this arrangement.

* PLO0 needs to have a range from 1GHz to 3GHz. I don't think this can be achieved with a single VCO. Could anything be done to utilise the second harmonic of the 1GHz to 2GHz PLO in order to support the 2G range? Perhaps two VCOs could be used with some means of switching between them. Is switching the LOs any easier that swicthing in the direct signal path? Perhaps the LO that is not used can be powered down so that the switch's isolation is less of an issue.

* Does the ADE-11 mixer perform adeqately with a 3GHz LO signal?

* Are there better ways of accomplishng the same thing.

Comments anyone? Please feel free to shoot me down in flames.

Mark

7395. RE: [spectrumanalyzer] Improved 2G and 3G bands

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-03 14:32:09 UTC
From: william sprowls
Topic: 7375 Message: 7395

Hi Mark,
 I like great ideas. Rarely, do they cost nothing and require no software changes. However, do not let that dissuade you. We can always decide if the cost/performance of an idea is valuable and make decisions accordingly. This is how the changes are made to the MSA and the project will continue to evolve.
Scotty

--- On Mon, 1/3/11, Mark Burgin <mark@mburgin.co.uk> wrote:

From: Mark Burgin <mark@...>
Subject: RE: [spectrumanalyzer] Improved 2G and 3G bands
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Monday, January 3, 2011, 5:36 AM

Scotty and SamI totally accept that there is very little practical reason to change anything in order to cover the "the small bare patch", and that the 21.4MHz images in 2G mode are just an inconvenience rather than a real problem. I like the idea of fiddling with the resoution filter centre frequency to determine if a signal is real or an image. For nearly all members of the group, it would not be worth the effort to change anything.However I might still play with the ideas further myself, but without wasting any more of the group's time. Of course, if I come up with a great idea that costs no money and needs no software changes, I will report back! I'm an optimist!Thanks very much for taking the time to respond. I appreciate that the nature of my post meant that it was not posible to dash off a quick response and that you both had to use up some of your valuable time writing your replies.Mark From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of william sprowls
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7396. Re: Improved 2G and 3G bands

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-04 05:54:00 UTC
From: inlinebeginner
Topic: 7375 Message: 7396

Mark's post makes me undstand why HP8558B, a 1.5GHz SA, uses 2050MHz cavity filter. It's first LO runs from 2050 to 3550MHz.
To design a 3GHz SA without and spurs, we might need a LO above 6GHz, which is too difficult for a home made SA.
Maybe, we can design a 2.1GHz SA, some IC can provide 4.3GHz as LO with decent phase noise. the IC costs about $25. To do that, we need to redesign cavity filter to be 2050MHz or so, and find a first mixer which can work up to 4.3GHz. I think we have to add several switchs to switch the band... It would ba a lot of work.

Lin

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Mark,
> Â I like great ideas. Rarely, do they cost nothing and require no software changes. However, do not let that dissuade you. We can always decide if the cost/performance of an idea is valuable and make decisions accordingly. This is how the changes are made to the MSA and the project will continue to evolve.
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> To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
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> spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of william sprowls
> Sent: 03 January 2011 00:34
> To: spectrumanalyzer@yahoogroups.com
> Subject: Re: [spectrumanalyzer] Improved 2G and 3G bands Â Â Hi Mark,
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7397. Re: Improved 2G and 3G bands

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-04 13:41:55 UTC
From: Sam
Topic: 7375 Message: 7397

Of course, if we had a 1.5 GHz SA, it would turn out that it would have its own "2G" band that could extend its range if you accept ghost images. Then we could think about raising the first IF to fix that 2G band, etc.

To me, having a basic 1 GHz 1G band, with a 2G band that has ghost images and a very usable 3G band, is pretty good. Especially since you can extend the range with a front-end down-mixer. Heck, if you have a stable 10 GHz signal source and a suitable mixer and band pass filter, you can bring the 10-11 GHz range down to 0-1 GHz and take a look at it.

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> Maybe, we can design a 2.1GHz SA, some IC can provide 4.3GHz as LO with decent phase noise. the IC costs about $25. To do that, we need to redesign cavity filter to be 2050MHz or so, and find a first mixer which can work up to 4.3GHz. I think we have to add several switchs to switch the band... It would ba a lot of work.
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> > Subject: RE: [spectrumanalyzer] Improved 2G and 3G bands
> > To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
> > Date: Monday, January 3, 2011, 5:36 AM
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Date: 2011-01-04 15:51:27 UTC
From: inlinebeginner
Topic: 7375 Message: 7398

We might want to design a front end module with Sam's idea, i.e use mixer as band selector.

For 1G band, we use MSA as is.

For 2G band, we kick in the mixer, and set the LO to 2GHz, when input signal changes from 1GHz to 2GHz, the IF lower image will be from 1GHz(=2GHz-1GHz) to 0Hz (2GHz -2GHz). The higher image (LO + Input) is above 2GHz, and can be filtered out with a 1GHz LPF. This requires software change to refenct the mirrored frequency.

For 3G band, we still kink in the mixer, and set the LO to 3GHz. when input signal changes from 2GHz to 3GHz, the IF output will change from 1GHz to 0 Hz.

For 4G band..., As the IC (contains PLL, VCO and Mixer) can go up to 4.3GHz, therefore, we have a 4G band. Just set the LO to 4GHz. same thing. At the band boundary, it could have small problem, because the mixer1 can not really work down to 0Hz, this can be done by set the LO 1MHz a little bit higher, i.e. at 2.001GHz, 3.001GHz, 4.001GHz.

The drawback of this method is that the noise floor will be raised several dB, therefore, we may need a 10dB LNA in front of mixer.
Does this work?
Lin

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> > > f. If the signal moves up in frequency by 1 KHz, it is an image signal at 1021.4 MHz.
> > > Sometimes it is ok to fool Mother Nature, or in this case, your MSA.
> > > Scotty
> > >
> > > --- On Sat, 1/1/11, Mark Burgin <mark@> wrote:
> > > From: Mark Burgin <mark@>
> > > Subject: [spectrumanalyzer] Improved 2G and 3G bands [1 Attachment]
> > > To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
> > > Date: Saturday, January 1, 2011, 4:00 PMÂ Hi EveryoneI fully understand that the original design for the MSA had a 1GHz frequency limit and that the 2G and 3G bands were added on later "for free" just by some clever changes to the software and adjustments to the circuit topology.Â As such, it is to be expected that there are some small deficiencies with the operation of these bands,Â In particular, there are images at 21.4GHz offset in the 2G band, and the 3G band has a large spur at 2026.6MHz.Â Please don't think I am being critical in any way of the design of the MSA since I appreciate that

one of the key design goals was to make the device as cheap as possible while still achieving sufficent degree of usefulness.Â It does this admirably.However, I wondered what would be needed to change the existing design so that it had "proper" 2G, 3G, and perhaps higher, bands.Â What I mean by "proper" is bands which Â have the same quality as the 1G band. ie
> > > freedom from large spurs and images.Â Has anyone given this any thought?I am very inexperienced at RF design, but, for what it's worth, and to start off a discussion, here are my ideas (WHICH MIGHT BE UTTER RUBBISH, SO PLEASE DON'T MISTAKE ANY OF THE FOLLOWING FOR A GOOD DESIGN SUGGESTION).Â My understanding is that the basic problem with the 3G band is that the 1st IF lies within the range of required LO frequencies and so leakage through the mixer when the LO is at 1013.3MHz causes the large spur.Â In the 2G band, the problem is that the 1st IF is too low (10.7MHz) which makes it impossible to separate the frequencies of interest from their image frequencies.Â In both cases, a different 1st IF would alleviate the problem.Â A first IF which is just below 1GHz would cure both of these issues, however, the 1G band requires that the 1st IF is above 1GHz, otherwise an input signal which happens to be at the same frequency as the 1st IF would leak
> > > through the mixer and cause noise across the whole spectrum.Â It looks, therefore, that two different 1st IFs are required to support the three bands, but since the cavity filter is tuned to the 1013.3MHz, an additional cavity filter would be necessary along with the associated swiching arrangements.Â The cavity filter is bulky, time-consuming to make and quite expensive unless you happen to have all the materials to hand and so I wanted to avoid having to include another one in the system.I wondered about the possiblilty of adding another mixer and PLO in front of MIXER 1 in the current design to create a new 1st IF (I call it IF0 from here on) that can be swicthed between a frequency just above 1GHz and just below 1GHz depending on the band.Â The exisiting MIXER 1 could then be used to convert either of the two different IF0 frequencies to 1013.3MHz as normal.Â I have attempted to show the arrangement in the attached pdf file (I hope my attachment
> > > works!).For the 2G band, IF0 is set to 986.7MHz and the new PLO, PLO0 is swept from 1986.7MHz to 2986.7MHz.Â I appreciate that this is outside the capabilites of the current PLO and so a new design would be required.Â PLO1 (exisiting) is set to a fixed frequency of 2000MHz) which will convert IF0 to 1013.3MHz.For the 3G band, IF0 is also set to 986.7MHz with its PLO swept from 1013.3MHz to 2013.3MHz.Â This can be done by the exisiting PLO1 design.For the 1G band, two possibilities exist.Â PLO1 is not really needed for this mode since the new PLO0 could sweep from 1013.3MHz to 2013.3MHz so that the output from MIXER0 (the new mixer) could feed into the cavity filter directly.Â However, this would require some signal switching to bypass MIXER1 when the 1G mode is selected.Â An alternative would be to sweep LO0 from 1018.7MHz to 2018.7MHz, creating an IF0 of 1018.7MHz.Â If PLO1 is set to 2032MHz, MIXER1 will output the required 1013.3MHz without any
> > > switching being required.Â I also considered making IF0 1013.3MHz in this band, with LO1 set to 2026.6 MHz, this also gives 1013.3MHz at the output of MIXER1 butÂ I am not sure that I understand the mixing process well enough to be sure that all would work OK when the RF signal and IF signal are at the same frequency and the LO is at twice that frequency.Â Note that if the PLO1 frequencies shown are chosen (multiples of 4MHz), I think PLO1 could be driven from the 64MHz clock, freeing up DDS1 to be used to drive the new PLO0.What are the difficulties with this arrangement?Â Well, I can see a few and I am sure there are many others that I can't see.Â·Â Â Â Â Â Â Â Â Addional cost.Â Is it worth it for the small (hoped for) benefits?Â Probably not, but I am a bit of a purist.Â What if I want to look at a signal near 2026.6MHz? Â What if I want to look at a signal in the 2G band that is 21.4MHz above another signal?Â I know! How likely is
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phase noise and conversion loss.Â Will this be much of a problem?Â Since PLO1 does not need to sweep in frequency in this arrangement, I presume that it could be changed to improve its phase noise. Â·Â Â Â Â Â Â Â Â The software would need to be changed extensively to support this arrangement.Â·Â Â Â Â Â Â Â Â PLO0 needs to have a range from 1GHz to 3GHz.Â I don't think this can be achieved with a single VCO.Â Could anything be done to utilise the second harmonic of the 1GHz to 2GHz PLO in order to support the 2G range? Â Â Perhaps two VCOs could be used with some means of switching between them.Â Is switching the LOs any easier that swicthing in the direct signal path?Â Perhaps the LO that is not used can be powered down so that the switch's isolation is less of an issue.Â·Â Â Â Â Â Â Â Â Does the ADE-11 mixer perform adeqately with a 3GHz LO
> > > signal?Â·Â Â Â Â Â Â Â Â Are there better ways of accomplishng the same thing.Comments anyone?Â Please feel free to shoot me down in flames.Mark Â
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7399. RE: [spectrumanalyzer] Re: Improved 2G and 3G bands

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-04 19:24:51 UTC
From: Mark Burgin
Topic: 7375 Message: 7399

Hi Lin
Unfortunately, the image frequency at the input is always twice the IF away from the signal of interest. Since the IF goes from 0Hz to 1GHz in your scheme, the image frequency will be between 0Hz and 2GHz away from the signal of interest. For example, with the LO at 2GHz, a signal at 1.999GHz will convert to an IF of 1MHz (2000 - 1999 = 1). Unfortunatly, a signal at 2.001GHz (which is out of band but might still be present on the input) will also convert to 1MHz (1999 - 2000 = -1. The - sign is irrelevant since this is just a phase change). It would not be possible to design a filter that goes on the input that passes 1999MHz but rejects 2001MHz. Your spectrum analyser with a 2GHz LO would display the 1-2GHz and 2-3GHz spectrums simultaneously, much like the current design displays 0-1GHz and 2-3GHz signals simultaneously. Of course this is only a problem if out-of-band signals might be present on the input but this is often the case.
To avoid this issue, it is important that the IF is as high as possible since this creates a gap in which a filter on the input can roll off the response to the unwanted image frequencies. With the current MSA design with its 1.0133GHz 1st IF, filters could be placed on the input to pass 0-1GHz and reject 2-3GHz and vice-versa so that the 1G band and the 3G bands could be displayed separately if required. This is why I kept the 1st IF near to 1GHz in my scheme.
Mark

From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of inlinebeginner
Sent: 04 January 2011 15:51
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Re: Improved 2G and 3G bands

We might want to design a front end module with Sam's idea, i.e use mixer as band selector.

For 1G band, we use MSA as is.

For 2G band, we kick in the mixer, and set the LO to 2GHz, when input signal changes from 1GHz to 2GHz, the IF lower image will be from 1GHz(=2GHz-1GHz) to 0Hz (2GHz -2GHz). The higher image (LO + Input) is above 2GHz, and can be filtered out with a 1GHz LPF. This requires software change to refenct the mirrored frequency.

For 3G band, we still kink in the mixer, and set the LO to 3GHz. when input signal changes from 2GHz to 3GHz, the IF output will change from 1GHz to 0 Hz.

For 4G band..., As the IC (contains PLL, VCO and Mixer) can go up to 4.3GHz, therefore, we have a 4G band. Just set the LO to 4GHz. same thing. At the band boundary, it could have small problem, because the mixer1 can not really work down to 0Hz, this can be done by set the LO 1MHz a little bit higher, i.e. at 2.001GHz, 3.001GHz, 4.001GHz.

The drawback of this method is that the noise floor will be raised several dB, therefore, we may need a 10dB LNA in front of mixer.
Does this work?
Lin

--- In spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@...> wrote:
>
> Of course, if we had a 1.5 GHz SA, it would turn out that it would have its own "2G" band that could extend its range if you accept ghost images. Then we could think about raising the first IF to fix that 2G band, etc.
>
> To me, having a basic 1 GHz 1G band, with a 2G band that has ghost images and a very usable 3G band, is pretty good. Especially since you can extend the range with a front-end down-mixer. Heck, if you have a stable 10 GHz signal source and a suitable mixer and band pass filter, you can bring the 10-11 GHz range down to 0-1 GHz and take a look at it.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Mark's post makes me undstand why HP8558B, a 1.5GHz SA, uses 2050MHz cavity filter. It's first LO runs from 2050 to 3550MHz.
> > To design a 3GHz SA without and spurs, we might need a LO above 6GHz, which is too difficult for a home made SA.
> > Maybe, we can design a 2.1GHz SA, some IC can provide 4.3GHz as LO with decent phase noise. the IC costs about $25. To do that, we need to redesign cavity filter to be 2050MHz or so, and find a first mixer which can work up to 4.3GHz. I think we have to add several switchs to switch the band... It would ba a lot of work.
> >
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>, william sprowls <wsprowls@> wrote:
> > >
> > > Hi Mark,
> > > Â I like great ideas. Rarely, do they cost nothing and require no software changes. However, do not let that dissuade you. We can always decide if the cost/performance of an idea is valuable and make decisions accordingly. This is how the changes are made to the MSA and the project will continue to evolve.
> > > Scotty
> > >
> > > --- On Mon, 1/3/11, Mark Burgin <mark@> wrote:
> > >
> > > From: Mark Burgin <mark@>
> > > Subject: RE: [spectrumanalyzer] Improved 2G and 3G bands
> > > To: "spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>" <spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>>
> > > Date: Monday, January 3, 2011, 5:36 AM
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> > > Scotty and SamI totally accept that there is very little practical reason to change anything in order to cover the "the small bare patch", and that the 21.4MHz images in 2G mode are just an inconvenience rather than a real problem.Â Â I like the idea of fiddling with the resoution filter centre frequency to determine if a signal is real or an image.Â For nearly all members of the group, it would not be worth the effort to change anything.However I might still play with the ideas further myself, but without wasting any more of the group's time.Â Of course, if I come up with a great idea that costs no money and needs no software changes, I will report back!Â I'm an optimist!Thanks very much for taking the time to respond.Â I appreciate that the nature of my post meant that it was not posible to dash off a quick response and that you both had to use up some of your valuable time writing your replies.Mark Â Â Â From:
> > > spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com> [mailto:spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>] On Behalf Of william sprowls
> > > Sent: 03 January 2011 00:34
> > > To: spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>
> > > Subject: Re: [spectrumanalyzer] Improved 2G and 3G bands Â Â Hi Mark,
> > > Â After some reflection, let me respond to your comments.
> > > Your assumptions are quite correct. For sure, both 2G and 3G MSA operations are not "proper" topology, they are "icing on the cake". The cake is 1G. For "proper" topologies, to minimize spurious, it would be best to have a stand-alone MSA for each band. Adding the Mixer 0 topology will work, but has the potential to introduce another magnitude of spurious. (Plus that added cost). In my honest opinion (and how I use an analyzer, it is not worth the cost/complexity.
> > > Â As pointed out, the 3G Band contains only a few obvious spurs (total "inop" when trying to look at an external signal at, or near 2026.6 Hz). However, I think it is a minor encumbrance when the rest of 3G is quite good. (All that icing with a small bare patch).
> > >
> > > Â 2G in MSA has image frequencies completely across the band. Nobody in his right mind would design a Spectrum Analyzer with this topology. (VNA operation here is not affected). The user needs to understand that if he is looking for unknown signals, he cannot be immediately assured that a response is a normal or image signal. It would be nice for the MSA to do something automatically and say "the response you see is a normal signal" or "the response you see is an image signal". Until we (Sam and I) come up with something cool, the user can manually determine this ambiguity. Here are two ways it is done:
> > > 1. If your MSA has at least two Resolution Filters that are not the same frequency: Example, Path 1 =10.7 MHz and Path 2 = 10.11 Mhz
> > > a. In Path 1, you are scanning and see a signal at 1000 MHz.
> > > b. Halt the sweep and change the sweep parameters to place the signal at the center

of the graph (CF = 1000 MHz)
> > > c. Change to Path 2 and sweep again.
> > > d. If the signal remains in the center, it is normal signal at 1000 MHz.
> > > e. If the signal disappears or moves, it is an image signal at 1021.4 MHz.
> > >
> > > 2. If you have only one Resolution Filter (at 10.7 MHz)
> > > a. Go to the Hardware Configuration Manager and lie to it by adding a Path 2 at 10.701 Mhz. (1 KHz higher than your real Filter)
> > > b. In Path 1, you are scanning and see a signal at 1000 MHz.
> > > c. Halt the sweep and change the sweep parameters to place the signal at the center of the graph (CF = 1000 MHz)
> > > d. Change to Path 2 and sweep again.
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> > > To: "spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>" <spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>>
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> > > works!).For the 2G band, IF0 is set to 986.7MHz and the new PLO, PLO0 is swept from 1986.7MHz to 2986.7MHz.Â I appreciate that this is outside the capabilites of the current PLO and so a new design would be required.Â PLO1 (exisiting) is set to a fixed frequency of 2000MHz) which will convert IF0 to 1013.3MHz.For the 3G band, IF0 is also set to 986.7MHz with its PLO swept from 1013.3MHz to 2013.3MHz.Â This can be done by the exisiting PLO1 design.For the 1G band, two possibilities exist.Â PLO1 is not really needed for this mode since the new PLO0 could sweep from 1013.3MHz to 2013.3MHz so that the output from MIXER0 (the new mixer) could feed into the cavity filter directly.Â However, this would require some signal switching to bypass MIXER1 when the 1G mode is selected.Â An alternative would be to sweep LO0 from 1018.7MHz to 2018.7MHz, creating an IF0 of 1018.7MHz.Â If PLO1 is set to 2032MHz, MIXER1 will output the required 1013.3MHz without any
> > > switching being required.Â I also considered making IF0 1013.3MHz in this band, with LO1 set to 2026.6 MHz, this also gives 1013.3MHz at the output of MIXER1 butÂ I am not sure that I understand the mixing process well enough to be sure that all would work OK when the RF signal and IF signal are at the same frequency and the LO is at twice that frequency.Â Note that if the PLO1 frequencies shown are chosen (multiples of 4MHz), I think PLO1 could be driven from the 64MHz clock, freeing up DDS1 to be used to drive the new PLO0.What are the difficulties with this arrangement?Â Well, I can see a few and I am sure there are many others that I can't see.Â·Â Â Â Â Â Â Â Â Â Addional cost.Â Is it worth it for the small (hoped for) benefits?Â Probably not, but I am a bit of a purist.Â What if I want to look at a signal near 2026.6MHz? Â What if I want to look at a signal in the 2G band that is 21.4MHz above another signal?Â I know! How likely is
> > > that?Â·Â Â Â Â Â Â Â Â Â In all modes there is an extra mixing stage introducing more phase noise and conversion loss.Â Will this be much of a problem?Â Since PLO1 does not need to sweep in frequency in this arrangement, I presume that it could be changed to improve its phase noise. Â·Â Â Â Â Â Â Â Â Â The software would need to be changed extensively to support this arrangement.Â·Â Â Â Â Â Â Â Â Â PLO0 needs to have a range from 1GHz to 3GHz.Â I don't think this can be achieved with a single VCO.Â Could anything be done to utilise the second harmonic of the 1GHz to 2GHz PLO in order to support the 2G range? Â Â Perhaps two VCOs could be used with some means of switching between them.Â Is switching the LOs any easier that swicthing in the direct signal path?Â Perhaps the LO that is not used can be powered down so that the switch's isolation is less of an issue.Â·Â Â Â Â Â Â Â Â Â Does the ADE-11 mixer perform adeqately with a 3GHz LO
> > > signal?Â·Â Â Â Â Â Â Â Â Â Are there better ways of accomplishng the same thing.Comments anyone?Â Please feel free to shoot me down in flames.Mark Â
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7400. Directional Couplers

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-05 00:11:01 UTC
From: Sam
Topic: 6702 Message: 7400

A directional coupler can make a simple bridge for the MSA in Reflection Mode. Some ZEDC-15-2B (1-1000 MHz) couplers are available on eBay, for $14.99, with free shipping:

http://cgi.ebay.com/Mini-Circuits-Directional-Coupler-ZEDC-15-2B-1-1000MHz-/270648790996?pt=LH_DefaultDomain_0&hash=item3f03eccfd4

These are Minicircuits devices packed in very small metal boxes with SMA connectors. I bought another type of MCL coupler and tested it; the results were disappointing and nowhere near MCL's datasheet graphs. But I bought a ZEDC-15-2B from this seller and tested its directivity, which matched the datasheet very well. The directivity ranges from near 70 dB at 1 MHz to 25 dB at 500 MHz and 18 dB at 1 GHz. 70 dB is phenomenal; 25 dB is good and 18 dB is very usable.

For a general purpose bridge, at this size and cost the ZEDC is hard to beat.

There are also other offerings on eBay for this coupler. One of them is priced over $300, which is completely insane, so be careful which one you sign up for.

Sam W.

7402. Re: Improved 2G and 3G bands

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-05 04:38:11 UTC
From: inlinebeginner
Topic: 7375 Message: 7402

Mark
You are right, the boundary will have problems to process. I hope someone can figure out a software way to calculate the boundary.
In the real world, if I want to measure a 40MHz bandwidth spectrum at 12GHz, and we only have a 3GHz SA, what do we do? Use a mixer and LO. If the spectrum is at the boundary, we have to adjust the LO frequency to move the spectrum away the boundary. If we can manully to do this, we might be able to let computer do it automatically when the condition can be met.
Anyway, this is a good discussion. It makes us think about something that we did not pay attention.
Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, Mark Burgin <mark@...> wrote:
>
> Hi Lin
> Unfortunately, the image frequency at the input is always twice the IF away from the signal of interest. Since the IF goes from 0Hz to 1GHz in your scheme, the image frequency will be between 0Hz and 2GHz away from the signal of interest. For example, with the LO at 2GHz, a signal at 1.999GHz will convert to an IF of 1MHz (2000 - 1999 = 1). Unfortunatly, a signal at 2.001GHz (which is out of band but might still be present on the input) will also convert to 1MHz (1999 - 2000 = -1. The - sign is irrelevant since this is just a phase change). It would not be possible to design a filter that goes on the input that passes 1999MHz but rejects 2001MHz. Your spectrum analyser with a 2GHz LO would display the 1-2GHz and 2-3GHz spectrums simultaneously, much like the current design displays 0-1GHz and 2-3GHz signals simultaneously. Of course this is only a problem if out-of-band signals might be present on the input but this is often the case.
> To avoid this issue, it is important that the IF is as high as possible since this creates a gap in which a filter on the input can roll off the response to the unwanted image frequencies. With the current MSA design with its 1.0133GHz 1st IF, filters could be placed on the input to pass 0-1GHz and reject 2-3GHz and vice-versa so that the 1G band and the 3G bands could be displayed separately if required. This is why I kept the 1st IF near to 1GHz in my scheme.
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> Sent: 04 January 2011 15:51
> To: spectrumanalyzer@yahoogroups.com
> Subject: [spectrumanalyzer] Re: Improved 2G and 3G bands
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> The drawback of this method is that the noise floor will be raised several dB, therefore, we may need a 10dB LNA in front of mixer.
> Does this work?
> Lin
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> > > >
> > > > Hi Mark,
> > > > Â I like great ideas. Rarely, do they cost nothing and require no software changes. However, do not let that dissuade you. We can always decide if the cost/performance of an idea is valuable and make decisions accordingly. This is how the changes are made to the MSA and the project will continue to evolve.
> > > > Scotty
> > > >
> > > > --- On Mon, 1/3/11, Mark Burgin <mark@> wrote:
> > > >
> > > > From: Mark Burgin <mark@>
> > > > Subject: RE: [spectrumanalyzer] Improved 2G and 3G bands
> > > > To: "spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>" <spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>>
> > > > Date: Monday, January 3, 2011, 5:36 AM
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> > > > Scotty and SamI totally accept that there is very little practical reason to change anything in order to cover the "the small bare patch", and that the 21.4MHz images in 2G mode are just an inconvenience rather than a real problem.Â Â I like the idea of fiddling with the resoution filter centre frequency to determine if a signal is real or an image.Â For nearly all members of the group, it would not be worth the effort to change anything.However I might still play with the ideas further myself, but without wasting any more of the group's time.Â Of course, if I come up with a great idea that costs no money and needs no software changes, I will report back!Â I'm an optimist!Thanks very much for taking the time to respond.Â I appreciate that the nature of my post meant that it was not posible to dash off a quick response and that you both had to use up some of your valuable time writing your replies.Mark Â Â Â From:
> > > > spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com> [mailto:spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>] On Behalf Of william sprowls
> > > > Sent: 03 January 2011 00:34
> > > > To: spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>
> > > > Subject: Re: [spectrumanalyzer] Improved 2G and 3G bands Â Â Hi Mark,
> > > > Â After some reflection, let me respond to your comments.

> > > > Your assumptions are quite correct. For sure, both 2G and 3G MSA operations are not "proper" topology, they are "icing on the cake". The cake is 1G. For "proper" topologies, to minimize spurious, it would be best to have a stand-alone MSA for each band. Adding the Mixer 0 topology will work, but has the potential to introduce another magnitude of spurious. (Plus that added cost). In my honest opinion (and how I use an analyzer, it is not worth the cost/complexity.
> > > > Â As pointed out, the 3G Band contains only a few obvious spurs (total "inop" when trying to look at an external signal at, or near 2026.6 Hz). However, I think it is a minor encumbrance when the rest of 3G is quite good. (All that icing with a small bare patch).
> > > >
> > > > Â 2G in MSA has image frequencies completely across the band. Nobody in his right mind would design a Spectrum Analyzer with this topology. (VNA operation here is not affected). The user needs to understand that if he is looking for unknown signals, he cannot be immediately assured that a response is a normal or image signal. It would be nice for the MSA to do something automatically and say "the response you see is a normal signal" or "the response you see is an image signal". Until we (Sam and I) come up with something cool, the user can manually determine this ambiguity. Here are two ways it is done:
> > > > 1. If your MSA has at least two Resolution Filters that are not the same frequency: Example, Path 1 =10.7 MHz and Path 2 = 10.11 Mhz
> > > > a. In Path 1, you are scanning and see a signal at 1000 MHz.
> > > > b. Halt the sweep and change the sweep parameters to place the signal at the center of the graph (CF = 1000 MHz)
> > > > c. Change to Path 2 and sweep again.
> > > > d. If the signal remains in the center, it is normal signal at 1000 MHz.
> > > > e. If the signal disappears or moves, it is an image signal at 1021.4 MHz.
> > > >
> > > > 2. If you have only one Resolution Filter (at 10.7 MHz)
> > > > a. Go to the Hardware Configuration Manager and lie to it by adding a Path 2 at 10.701 Mhz. (1 KHz higher than your real Filter)
> > > > b. In Path 1, you are scanning and see a signal at 1000 MHz.
> > > > c. Halt the sweep and change the sweep parameters to place the signal at the center of the graph (CF = 1000 MHz)
> > > > d. Change to Path 2 and sweep again.
> > > > e. If the signal moves down in frequency by 1 KHz, it is normal signal at 1000 MHz.
> > > > f. If the signal moves up in frequency by 1 KHz, it is an image signal at 1021.4 MHz.
> > > > Sometimes it is ok to fool Mother Nature, or in this case, your MSA.
> > > > Scotty
> > > >
> > > > --- On Sat, 1/1/11, Mark Burgin <mark@> wrote:
> > > > From: Mark Burgin <mark@>
> > > > Subject: [spectrumanalyzer] Improved 2G and 3G bands [1 Attachment]
> > > > To: "spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>" <spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>>
> > > > Date: Saturday, January 1, 2011, 4:00 PMÂ Hi EveryoneI fully understand that the original design for the MSA had a 1GHz frequency limit and that the 2G and 3G bands were added on later "for free" just by some clever changes to the software and adjustments to the circuit topology.Â As such, it is to be expected that there are some small deficiencies with the operation of these bands,Â In particular, there are images at 21.4GHz offset in the 2G band, and the 3G band has a large spur at 2026.6MHz.Â Please don't think I am being

critical in any way of the design of the MSA since I appreciate that one of the key design goals was to make the device as cheap as possible while still achieving sufficent degree of usefulness.Â It does this admirably.However, I wondered what would be needed to change the existing design so that it had "proper" 2G, 3G, and perhaps higher, bands.Â What I mean by "proper" is bands which Â have the same quality as the 1G band. ie
> > > > freedom from large spurs and images.Â Has anyone given this any thought?I am very inexperienced at RF design, but, for what it's worth, and to start off a discussion, here are my ideas (WHICH MIGHT BE UTTER RUBBISH, SO PLEASE DON'T MISTAKE ANY OF THE FOLLOWING FOR A GOOD DESIGN SUGGESTION).Â My understanding is that the basic problem with the 3G band is that the 1st IF lies within the range of required LO frequencies and so leakage through the mixer when the LO is at 1013.3MHz causes the large spur.Â In the 2G band, the problem is that the 1st IF is too low (10.7MHz) which makes it impossible to separate the frequencies of interest from their image frequencies.Â In both cases, a different 1st IF would alleviate the problem.Â A first IF which is just below 1GHz would cure both of these issues, however, the 1G band requires that the 1st IF is above 1GHz, otherwise an input signal which happens to be at the same frequency as the 1st IF would leak
> > > > through the mixer and cause noise across the whole spectrum.Â It looks, therefore, that two different 1st IFs are required to support the three bands, but since the cavity filter is tuned to the 1013.3MHz, an additional cavity filter would be necessary along with the associated swiching arrangements.Â The cavity filter is bulky, time-consuming to make and quite expensive unless you happen to have all the materials to hand and so I wanted to avoid having to include another one in the system.I wondered about the possiblilty of adding another mixer and PLO in front of MIXER 1 in the current design to create a new 1st IF (I call it IF0 from here on) that can be swicthed between a frequency just above 1GHz and just below 1GHz depending on the band.Â The exisiting MIXER 1 could then be used to convert either of the two different IF0 frequencies to 1013.3MHz as normal.Â I have attempted to show the arrangement in the attached pdf file (I hope my attachment
> > > > works!).For the 2G band, IF0 is set to 986.7MHz and the new PLO, PLO0 is swept from 1986.7MHz to 2986.7MHz.Â I appreciate that this is outside the capabilites of the current PLO and so a new design would be required.Â PLO1 (exisiting) is set to a fixed frequency of 2000MHz) which will convert IF0 to 1013.3MHz.For the 3G band, IF0 is also set to 986.7MHz with its PLO swept from 1013.3MHz to 2013.3MHz.Â This can be done by the exisiting PLO1 design.For the 1G band, two possibilities exist.Â PLO1 is not really needed for this mode since the new PLO0 could sweep from 1013.3MHz to 2013.3MHz so that the output from MIXER0 (the new mixer) could feed into the cavity filter directly.Â However, this would require some signal switching to bypass MIXER1 when the 1G mode is selected.Â An alternative would be to sweep LO0 from 1018.7MHz to 2018.7MHz, creating an IF0 of 1018.7MHz.Â If PLO1 is set to 2032MHz, MIXER1 will output the required 1013.3MHz without any
> > > > switching being required.Â I also considered making IF0 1013.3MHz in this band, with LO1 set to 2026.6 MHz, this also gives 1013.3MHz at the output of MIXER1 butÂ I am not sure that I understand the mixing process well enough to be sure that all would work OK when the RF signal and IF signal are at the same frequency and the LO is at twice that frequency.Â Note that if the PLO1 frequencies shown are chosen (multiples of 4MHz), I think PLO1 could be driven from the 64MHz clock, freeing up DDS1 to be used to drive the new PLO0.What are the difficulties with this arrangement?Â Well, I can see a few and I am sure there are many others that I can't see.Â·Â Â Â Â Â Â Â Â Â Addional cost.Â Is it worth it for the small (hoped for) benefits?Â Probably not, but I am a bit of a purist.Â What if I want to look at a signal near 2026.6MHz? Â What if I want to look at a signal in the 2G band that is 21.4MHz above another signal?Â I know! How likely is
> > > > that?Â·Â Â Â Â Â Â Â Â Â In all modes there is an extra mixing stage introducing more phase noise and conversion loss.Â Will this be much of a problem?Â Since PLO1 does not need

to sweep in frequency in this arrangement, I presume that it could be changed to improve its phase noise. Â·Â Â Â Â Â Â Â Â The software would need to be changed extensively to support this arrangement.Â·Â Â Â Â Â Â Â Â PLO0 needs to have a range from 1GHz to 3GHz.Â I don't think this can be achieved with a single VCO.Â Could anything be done to utilise the second harmonic of the 1GHz to 2GHz PLO in order to support the 2G range? Â Â Perhaps two VCOs could be used with some means of switching between them.Â Is switching the LOs any easier that swicthing in the direct signal path?Â Perhaps the LO that is not used can be powered down so that the switch's isolation is less of an issue.Â·Â Â Â Â Â Â Â Â Does the ADE-11 mixer perform adeqately with a 3GHz LO
> > > > signal?Â·Â Â Â Â Â Â Â Â Are there better ways of accomplishng the same thing.Comments anyone?Â Please feel free to shoot me down in flames.Mark Â
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7403. Cypress USB connections

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-05 12:46:49 UTC
From: jghbeta
Topic: 7403 Message: 7403

I cannot find a mapping of the USB Cypress ports to the individual SLIMS. Is there such an animal?
Jim

7404. Re: Cypress USB connections

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-05 13:22:36 UTC
From: juanm0wwa
Topic: 7403 Message: 7404

Jim, on Files section/ USB controller folder/ Controller hardware.pdf document.

Juan, M0WWA

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> I cannot find a mapping of the USB Cypress ports to the individual SLIMS. Is there such an animal?
> Jim
>

7405. Re: [spectrumanalyzer] Re: Cypress USB connections

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-06 01:49:47 UTC
From: Jim Hontoria
Topic: 7403 Message: 7405

> Hi Sam, Dave
>
With the exception of the RBW there are no USB board ports defined for the
the software switching as includsed in the latest release (116)

Jim W1JGH

>
>

--
Jim G. Hontoria

7406. SMA polarity - arghh

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-06 03:49:11 UTC
From: pzerkel
Topic: 7406 Message: 7406

As I started to prepare my SMA connectors to solder onto the ADC tonight, I realized that I have PCB SMA connectors and cable-end connectors that LOOK LIKE they would mate up. The threads mate up -- but they both have male center pins!

So I've spent the last hour reading about SMA, RP-SMA, the FCC, Wi-Fi, etc. and have seen lots of opinions.

Clearly, I need to either purchase different PCB SMA connectors (with the "old" female center pin, OR purchase coax end RP-SMA connectors with the "new" female center pin. I hope that makes sense.

So, is there any good reason to go one way or the other? FWIW, I probably have more of the SMA PCB male-pin connectors now, than I do of the male pin coax ends.

And yes, Scotty, this exercise has made me seriously reconsider the 'direct coax' connection method.

7407. Re: [spectrumanalyzer] SMA polarity - arghh

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-06 04:18:32 UTC
From: william sprowls
Topic: 7406 Message: 7407

"Arghh" is right!
 I never thought there could be any confusion. All of the SMA connectors for mounting on the modules have been designated as females. If you make them males, it would be a hardship if you wanted to trade or sell modules to other builders.
  I would suggest you keep in conformance with the design.
Scotty

--- On Wed, 1/5/11, pzerkel <pzerkel@yahoo.com> wrote:

From: pzerkel <pzerkel@...>
Subject: [spectrumanalyzer] SMA polarity - arghh
To: spectrumanalyzer@yahoogroups.com
Date: Wednesday, January 5, 2011, 9:49 PM

As I started to prepare my SMA connectors to solder onto the ADC tonight, I realized that I have PCB SMA connectors and cable-end connectors that LOOK LIKE they would mate up. The threads mate up -- but they both have male center pins!

So I've spent the last hour reading about SMA, RP-SMA, the FCC, Wi-Fi, etc. and have seen lots of opinions.

Clearly, I need to either purchase different PCB SMA connectors (with the "old" female center pin, OR purchase coax end RP-SMA connectors with the "new" female center pin. I hope that makes sense.

So, is there any good reason to go one way or the other? FWIW, I probably have more of the SMA PCB male-pin connectors now, than I do of the male pin coax ends.

And yes, Scotty, this exercise has made me seriously reconsider the 'direct coax' connection method.

7408. Re: Cypress USB connections

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-06 12:07:51 UTC
From: david529007
Topic: 7403 Message: 7408

Hi Jim

I have an action outstanding with Sam to provide the code changes - not done it yet.

Dave

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> > Hi Sam, Dave
> >
> With the exception of the RBW there are no USB board ports defined for the
> the software switching as includsed in the latest release (116)
>
> Jim W1JGH
>
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> --
> Jim G. Hontoria
>

7409. Re: SMA polarity - arghh

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-06 15:10:37 UTC
From: Sam
Topic: 7406 Message: 7409

About a year ago, I also ended up with a batch of the reverse-polarity connectors. There was nothing in the description to indicate they were reversed, although it turned out the letters "RP" were embedded somewhere in the part number.

I thing the RP types are intended for antennas; perhaps so that you can only attach an antenna to a connector which expects to be connected to an antenna, and therefore meets FCC radiation requirements. If you use them, you will create no end of confusion for yourself in the future. I would throw them away.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> "Arghh" is right!
> Â I never thought there could be any confusion. All of the SMA connectors for mounting on the modules have been designated as females. If you make them males, it would be a hardship if you wanted to trade or sell modules to other builders.
> Â I would suggest you keep in conformance with the design.
> Scotty
>
> --- On Wed, 1/5/11, pzerkel <pzerkel@...> wrote:
>
> From: pzerkel <pzerkel@...>
> Subject: [spectrumanalyzer] SMA polarity - arghh
> To: spectrumanalyzer@yahoogroups.com
> Date: Wednesday, January 5, 2011, 9:49 PM
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> As I started to prepare my SMA connectors to solder onto the ADC tonight, I realized that I have PCB SMA connectors and cable-end connectors that LOOK LIKE they would mate up. The threads mate up -- but they both have male center pins!

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>
> So I've spent the last hour reading about SMA, RP-SMA, the FCC, Wi-Fi, etc. and have seen lots of opinions.
>
>
>
> Clearly, I need to either purchase different PCB SMA connectors (with the "old" female center pin, OR purchase coax end RP-SMA connectors with the "new" female center pin. I hope that makes sense.
>
>
>
> So, is there any good reason to go one way or the other? FWIW, I probably have more of the SMA PCB male-pin connectors now, than I do of the male pin coax ends.
>
>
>
> And yes, Scotty, this exercise has made me seriously reconsider the 'direct coax' connection method.
>

7410. Re: SMA polarity - arghh

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-06 16:12:46 UTC
From: pzerkel
Topic: 7406 Message: 7410

Sam,

Glad to know that I am not the only one. I believe I will follow everyone's advice and not use the "RP".

I did find this page which gives a short but good description of the history of the "problem". http://www.sparkfun.com/tutorials/140

-Paul

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> About a year ago, I also ended up with a batch of the reverse-polarity connectors. There was nothing in the description to indicate they were reversed, although it turned out the letters "RP" were embedded somewhere in the part number.
>
> I thing the RP types are intended for antennas; perhaps so that you can only attach an antenna to a connector which expects to be connected to an antenna, and therefore meets FCC radiation requirements. If you use them, you will create no end of confusion for yourself in the future. I would throw them away.
>
> Sam W.
>
>

7411. Image-free 2G

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-07 17:27:30 UTC
From: Sam
Topic: 7411 Message: 7411

With the recent discussion of using a down-converting front end to bring high frequency signals into the 0-1GHz range, it occurred to me that you could view most of the 2G signals by using LO2 (1024 MHz) as the LO for the front-end mixer. In SA mode you don't need to mix LO2 and LO3 for a TG signal, so you could use that extra LO2 output for the external mixer. With filtering limitations, this would probably let you view 1074-2024 MHz by shifting it down to 50-1000 MHz. The advantage over normal 2G would be the absence of ghost images.

An alternative way to do this would be to build an extra PLO1 (or PLO3) module to use as the external front-end LO. This would give you a lot of flexibility to view signals in the 1-3 GHz range, once you had a way to control the new LO frequency. Since its frequency would be changed only occasionally, a slow communication method such as a USB-Parallel converter could be used. Or see this page for the use of a thumbwheel and a USnooBie board to control an LMX2326:

<http://www.thegleam.com/ke5fx/stellex.htm>

That extra LO could also be used as a signal generator independent of the MSA, although it would only produce frequencies at fairly large increments unless you combined it with a DDS.

To carry this a step further, the above-cited page shows how to control a YIG tuned oscillator by means of a Stellex control board (which in turn uses the LMX2326). Both the control board and the YIGs have become widely available on eBay. The control board supposedly can handle the range 2-12 GHz (subject, of course, to the limitations of the YIG range.) This would let you reach very high frequencies.

Sam W.

7412. Re: Spectrum Analyzer Kit of parts

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-07 18:37:27 UTC
From: Clive
Topic: 6606 Message: 7412

Hi, I am very surprised. I have had three follows up to my email of August 2010 two today and another a few days ago.
Just to let everyone who might be interested, the kit of bits for Scottie's Spectrum Analyzer Project, was sold very soon after advertising it on here.

Only goes to show how well thought of Scottie's design is.

To all those who are looking for a kit. I suggest that put your request that are seeking one on here. I am sure there will be others who will never get round to building their kit and would be willing to pass it onto someone who will.

Good luck in your search.

73 Clive GW0PPO
--- In spectrumanalyzer@yahoogroups.com, "Clive" <clivejenner@...> wrote:
>
> Hi I have realised that I may never get round to building Scotties excellent SLIM version of the Spectrum Analyzer and have decided to pass on the kit I have built up to someone with more time than I seem to have available at the moment.
>
> If your interested please email me at clivejenner at orange dot net and I will mail you back with a complete list of what I have available
>
>
> I am looking for cost to me plus shipping with a few freebees thrown in.
>
> 73 Clive GW0PPO
>

7413. Re: [spectrumanalyzer] Re: Cypress USB connections

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-07 21:50:43 UTC
From: Jim Hontoria
Topic: 7403 Message: 7413

Dave,

I am having a problem with usb_configure when both the N2PK and the MSA are connected. Basically, with usb -configure I can configure and work with either one but, again, not both at the same time. In the setup tab, selecting the confihguration string does not necessarily result in finding the device. It appears that Windows 7 only recognizes one or the other driver but not both.
Jim W1JGH

On Thu, Jan 6, 2011 at 7:07 AM, david529007 <dave.roberts@...>wrote:

>
>
>
> Hi Jim
>
> I have an action outstanding with Sam to provide the code changes - not
> done it yet.
>
> Dave
>
>
> --- In spectrumanalyzer@yahoogroups.com<spectrumanalyzer%40yahoogroups.com>,
> Jim Hontoria <jghalpha@...> wrote:
> >
> > > Hi Sam, Dave
> > >
> > With the exception of the RBW there are no USB board ports defined for
> the
> > the software switching as includsed in the latest release (116)
> >
> > Jim W1JGH
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> > --
> > Jim G. Hontoria
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Jim G. Hontoria

7414. Spectrum analyzer kits available anywhere?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-09 11:35:39 UTC
From: vk2ben
Topic: 7414 Message: 7414

Hi everyone,

Back in August last year, one of our fellow members advertised that he had a full kit of boards and bits required to build up one of Scottie's MSA's.

Unfortunately (for me and a couple of other "kit hunters"), that gear was snapped up very quickly.

This has prompted me to ask the Group: has anyone else out there collected a complete, or mostly complete, kit of parts that either just needs constructing or perhaps needs a few more parts added to get it going?

Please let me know. Depending on what sort of investment it will require (it seems the cost of building an MSA can vary wildly), I may put my hand up to relieve you of it ;-) If it is out of my reach for the moment, perhaps somebody else in the Group would like to make an offer to you.

Anyone have a kit collecting dust out there?

I look forward to hearing from any takers.

Cheers,
Ben

7415. re:Spectrum analyzer kits available anywhere?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-09 17:23:56 UTC
From: Cash Olsen
Topic: 7414 Message: 7415

Hi group,

I've considered offering a kit of parts and boards, again. It would be helpful to determine the level of interest. Please contact me off-list to express your level of interest in boards, small kits or a master kit of parts.

--
73

Cash Olsen
KD5SSJ
ARRL Technical Specialist

7416. USB Questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-09 17:29:51 UTC
From: nealmartini
Topic: 7416 Message: 7416

Sam, David, & Others USB Knowledgeables,

I am trying to understand the documentation I find in the group files w.r.t. USB an dthe MSA. I am not very well versed in USB, so I apologize if some of my questions are naive. Here are a few questions I have:

1. Does the latest MSA software release have full support for USB, including the .dll and menu select options? Or is there a special version of the software for USB support?

2. If the answer to number 1. is yes, does the included driver assume the pin assignments shown in the files document for connecting a CY68013A USB controller board to an existing MSA Control Board?

3. If you connect a CY68013A USB controller board to an existing Control Board, is there any throughput hit?

4. I assume it is WIN7 compatible.

5. Is someone designing a SLIM version of a USB board that can be used in place of the current MSA Control Board.

Sorry for all the questions. Thanks in advance for your help on this.

Neal

7417. Re: USB Questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-09 18:20:07 UTC
From: Sam
Topic: 7416 Message: 7417

Neal,
The next release of the software, for which the beta has been posted, will provide full USB support by making calls to Dave's driver. You would use the Configuration Manager to tell the MSA software that you are using USB rather than the parallel port. I'll let Dave respond as to the details of the driver.

The general plan is to be able to allow users to control the MSA through the existing control board or directly, bypassing the control board. My plan is to wire an off-the-shelf Cypress board ($30) to the parallel port input of the control board. I suppose in theory it is slower to run the data through the existing control board, but I doubt there would be a measurable speed hit. USB likely will be faster than the parallel port, so the dominant factor in determining overall speed will be the processing of data, not communication with the hardware. In VNA modes, the dominant timing factor will generally be the amount of wait time needed to allow full settling.

I don't know of anyone designing a direct control board replacement that would contain the Cypress chip. For anyone who directly wires a Cypress board to the modules, I did design a board that provides +10V and +23V supplies--a similar concept to the Control Board but without the latches. That board was included with the Signal Router board for which there was a recent group buy.

It might be feasible for someone to merge the layout of the +10/+23V board with a Cypress board layout such as Dave Brainerd's.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> Sam, David, & Others USB Knowledgeables,
>
> I am trying to understand the documentation I find in the group files w.r.t. USB an dthe MSA. I am not very well versed in USB, so I apologize if some of my questions are naive. Here are a few questions I have:
>
> 1. Does the latest MSA software release have full support for USB, including the .dll and menu select options? Or is there a special version of the software for USB support?
>
> 2. If the answer to number 1. is yes, does the included driver assume the pin assignments shown in the files document for connecting a CY68013A USB controller board to an existing MSA Control Board?
>
> 3. If you connect a CY68013A USB controller board to an existing Control Board, is there any throughput hit?
>
> 4. I assume it is WIN7 compatible.
>

> 5. Is someone designing a SLIM version of a USB board that can be used in place of the current MSA Control Board.
>
> Sorry for all the questions. Thanks in advance for your help on this.
>
> Neal
>

7418. Re: [spectrumanalyzer] Re: USB Questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-09 18:58:18 UTC
From: Jim Hontoria
Topic: 7416 Message: 7418

Hi Neal,
This is my take on the subject:
- I have been running Windows 7 64 bit
- Release 116, as released a couple of days ago, supports USB. Not all the functionality is still available, for example, only the resolution filters are selectable. There is only one version of the software both usable with USB or the control board.
- The pin assignments to the CB are correct. I run USB like that up to a couple of days ago. I am in the process of moving everything to a new box that will not use the CB: only USB. I HAVE CONFIGURED USB ALREADY AND THE SOFTWARE IS TALKING TO THE HARDWARE. AS WE SPEAK, I AM STILL TESTING.
- I have had issues with the installation USB drivers that Dave is helping me with.

I hope the above is of some help.

Jim W1JGH

On Sun, Jan 9, 2011 at 1:20 PM, Sam <swetterlin@...> wrote:

>
>
> Neal,
> The next release of the software, for which the beta has been posted, will
> provide full USB support by making calls to Dave's driver. You would use the
> Configuration Manager to tell the MSA software that you are using USB rather
> than the parallel port. I'll let Dave respond as to the details of the
> driver.
>
> The general plan is to be able to allow users to control the MSA through
> the existing control board or directly, bypassing the control board. My plan
> is to wire an off-the-shelf Cypress board ($30) to the parallel port input
> of the control board. I suppose in theory it is slower to run the data
> through the existing control board, but I doubt there would be a measurable
> speed hit. USB likely will be faster than the parallel port, so the dominant
> factor in determining overall speed will be the processing of data, not
> communication with the hardware. In VNA modes, the dominant timing factor
> will generally be the amount of wait time needed to allow full settling.
>
> I don't know of anyone designing a direct control board replacement that
> would contain the Cypress chip. For anyone who directly wires a Cypress
> board to the modules, I did design a board that provides +10V and +23V
> supplies--a similar concept to the Control Board but without the latches.
> That board was included with the Signal Router board for which there was a
> recent group buy.
>

> It might be feasible for someone to merge the layout of the +10/+23V board
> with a Cypress board layout such as Dave Brainerd's.
>
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com<spectrumanalyzer%40yahoogroups.com>,
> "nealmartini" <nealmartini@...> wrote:
> >
> > Sam, David, & Others USB Knowledgeables,
> >
> > I am trying to understand the documentation I find in the group files
> w.r.t. USB an dthe MSA. I am not very well versed in USB, so I apologize if
> some of my questions are naive. Here are a few questions I have:
> >
> > 1. Does the latest MSA software release have full support for USB,
> including the .dll and menu select options? Or is there a special version of
> the software for USB support?
> >
> > 2. If the answer to number 1. is yes, does the included driver assume the
> pin assignments shown in the files document for connecting a CY68013A USB
> controller board to an existing MSA Control Board?
> >
> > 3. If you connect a CY68013A USB controller board to an existing Control
> Board, is there any throughput hit?
> >
> > 4. I assume it is WIN7 compatible.
> >
> > 5. Is someone designing a SLIM version of a USB board that can be used in
> place of the current MSA Control Board.
> >
> > Sorry for all the questions. Thanks in advance for your help on this.
> >
> > Neal
> >
>
>
>

--
Jim G. Hontoria

7419. video filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-10 16:51:00 UTC
From: Sam
Topic: 7419 Message: 7419

I am finally testing my automated video filter, which is now crudely installed in my MSA. Its basic functioning is fine; my main concern was whether the 100 ohm series resistors on the large capacitors will unduly limit the filtering action. They are there to reduce the discharge surge when the power goes off. They do cause some reduction in filter efficacy, which caused me to make a couple of changes. On the Mag filters, there are two large capacitors, 10 uF ("Narrow") and 100 uF ("XNarrow"). I reduced their series resistors to 47 ohms. I also added a shunt 1 uF capacitor in parallel with the 100 uF/47 ohm combination to provide some filtering that is free of the resistance. The results are very good so far. I am also considering increasing the 0.1 uF capacitor (the "mid" filter) to 0.33 uF to give it a bit more oomph.

In the beta software, you can list your capacitors in the Configuration Manager, so you can use whatever values you are happy with.

I'd be interested in feedback from anyone else who has tried tinkering with the automated video filter.

Sam W.

7420. Re: [spectrumanalyzer]Parts ID

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-10 17:39:00 UTC
From: w4zcb
Topic: 7420 Message: 7420

Sam, can you or anyone else identify a tinylogic sized chip with only 3 legs (2 on one long side and one on the other) that is marked "TOAG"? I'm sure I bought them for something associated with the SA, but the term also has some meaning associated with an Egyptian god of some sort and Google is no help at all. Maybe a regulator???

Regards
W4ZCB

7421. Re: video filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-10 20:26:15 UTC
From: Sam
Topic: 7419 Message: 7421

I settled on filter component values that seem good for now. I posted a revised video board schematic on my web site at

<http://www.wetterlin.org/sam/SA/VideoFilter.zip>

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I am finally testing my automated video filter, which is now crudely installed in my MSA. Its basic functioning is fine; my main concern was whether the 100 ohm series resistors on the large capacitors will unduly limit the filtering action. They are there to reduce the discharge surge when the power goes off. They do cause some reduction in filter efficacy, which caused me to make a couple of changes. On the Mag filters, there are two large capacitors, 10 uF ("Narrow") and 100 uF ("XNarrow"). I reduced their series resistors to 47 ohms. I also added a shunt 1 uF capacitor in parallel with the 100 uF/47 ohm combination to provide some filtering that is free of the resistance. The results are very good so far. I am also considering increasing the 0.1 uF capacitor (the "mid" filter) to 0.33 uF to give it a bit more oomph.
>
> In the beta software, you can list your capacitors in the Configuration Manager, so you can use whatever values you are happy with.
>
> I'd be interested in feedback from anyone else who has tried tinkering with the automated video filter.
>
> Sam W.
>

7422. 116 beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-10 21:03:42 UTC
From: Sam
Topic: 7422 Message: 7422

I posted a new version of the beta version 116 software in the Files section at:

<http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_version116_4d_Beta.zip>

This fixes a couple of irritating bugs--one with saving files and one with the Filter Analysis function. It also contains a new test routine created by Scotty for scanning/tuning the cavity filter without having to tinker with cables, which isn't documented yet but will be when any kinks are ironed out.

Sam W.

7423. Re: [spectrumanalyzer]Parts ID

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-10 20:43:43 UTC
From: Sam
Topic: 7420 Message: 7423

I took a couple of guesses and looked up the parts, but they didn't work. I have used a couple voltage references and a 2907 transistor in that type of package, but their markings don't fit. Scotty used a pre-biased transistor in SOT-23; I don't recall the exact number(MUN...) but the one I guessed at had the wrong markings. That's all I can think of.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "w4zcb" <w4zcb@...> wrote:
>
> Sam, can you or anyone else identify a tinylogic sized chip with only
> 3 legs (2 on one long side and one on the other) that is marked
> "TOAG"? I'm sure I bought them for something associated with the SA,
> but the term also has some meaning associated with an Egyptian god of
> some sort and Google is no help at all. Maybe a regulator???
>
> Regards
> W4ZCB
>

7424. Resolution filter shape

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-10 23:06:54 UTC
From: Mark Burgin
Topic: 7420 Message: 7424

Hi Everyone
At the moment, I only have a single completed resolution filter with a 7.5KHz nominal bandwidth. It uses the ITT 024DD MCF from eBay which seems to have the same specs as the QMF 10725 described on Scotty's web site.
My problem is with the shape of the filter's response. Its bandwidth (7.9KHz) and insertion loss (about 3dB) are both OK, but my problem is that it has a fair amount of passband ripple. I measure it as about 1.3dB even after tweaking the matching with variable caps. Now this wouldn't be so bad if the maximum of its reponse was in the centre but, unfortunately, there is a bit of a dip in its reponse near to the centre so that its maximum is significantly to the right of centre.
How should I calibrate this path? Using the maximum value or the value in the centre of the filter's reponse? Are there any tricks I can try to get the maximum more nearly in the centre?
As a side question, what is the ideal resolution filter shape? Should it be flat-topped with cliff-like sides or more rounded in its shape? On the one hand I imagine that flat-topped is best since this introduces least error if a narrow bandwidth signal if within the passband of the filter but not exactly at the centre, but the more rounded shape helps to ensure that maximum reponse occurs near to the filter's centre frequency so that I get more precise measurements of the frequencies in the signal.
Thanks
Mark

7425. Re: [spectrumanalyzer] Resolution filter shape

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-10 23:49:07 UTC
From: Robert Fish
Topic: 7420 Message: 7425

Hi Mark and all,

I have the same problem with the same filter. I just assumed that I had the wrong value Z matching components on the input and output. I have made no
attempt to tune it yet. I just threw it together to get something that works. I have some matched crystal sets that I will eventually make 4 resolution bandpass filters with.
But I have the same questions about ideal passband response.

Bob

> Hi Everyone
>
> At the moment, I only have a single completed resolution filter with a
> 7.5KHz nominal bandwidth. It uses the ITT 024DD MCF from eBay which
> seems to have the same specs as the QMF 10725 described on Scotty's
> web site.
>
> My problem is with the shape of the filter's response. Its bandwidth
> (7.9KHz) and insertion loss (about 3dB) are both OK, but my problem is
> that it has a fair amount of passband ripple. I measure it as about
> 1.3dB even after tweaking the matching with variable caps. Now this
> wouldn't be so bad if the maximum of its reponse was in the centre
> but, unfortunately, there is a bit of a dip in its reponse near to the
> centre so that its maximum is significantly to the right of centre.
>
> How should I calibrate this path? Using the maximum value or the
> value in the centre of the filter's reponse? Are there any tricks I
> can try to get the maximum more nearly in the centre?
>
> As a side question, what is the /ideal/ resolution filter shape?
> Should it be flat-topped with cliff-like sides or more rounded in its
> shape? On the one hand I imagine that flat-topped is best since this
> introduces least error if a narrow bandwidth signal if within the
> passband of the filter but not exactly at the centre, but the more
> rounded shape helps to ensure that maximum reponse occurs near to the
> filter's centre frequency so that I get more precise measurements of
> the frequencies in the signal.
>
> Thanks
>
> Mark
>
>

7426. Re: Resolution filter shape

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-11 03:58:55 UTC
From: inlinebeginner
Topic: 7420 Message: 7426

If we look at the commercial SA RBW filter shape, it is similar to a triangle.
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1237712515/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc
It is not top flat.

Lin

--- In spectrumanalyzer@yahoogroups.com, Robert Fish <rwfish@...> wrote:
>
> Hi Mark and all,
>
> I have the same problem with the same filter. I just assumed that I had
> the wrong value Z matching components on the input and output. I have
> made no
> attempt to tune it yet. I just threw it together to get something that
> works. I have some matched crystal sets that I will eventually make 4
> resolution bandpass filters with.
> But I have the same questions about ideal passband response.
>
> Bob
>
>
> > Hi Everyone
> >
> > At the moment, I only have a single completed resolution filter with a
> > 7.5KHz nominal bandwidth. It uses the ITT 024DD MCF from eBay which
> > seems to have the same specs as the QMF 10725 described on Scotty's
> > web site.
> >
> > My problem is with the shape of the filter's response. Its bandwidth
> > (7.9KHz) and insertion loss (about 3dB) are both OK, but my problem is
> > that it has a fair amount of passband ripple. I measure it as about
> > 1.3dB even after tweaking the matching with variable caps. Now this
> > wouldn't be so bad if the maximum of its reponse was in the centre
> > but, unfortunately, there is a bit of a dip in its reponse near to the
> > centre so that its maximum is significantly to the right of centre.
> >
> > How should I calibrate this path? Using the maximum value or the
> > value in the centre of the filter's reponse? Are there any tricks I
> > can try to get the maximum more nearly in the centre?
> >
> > As a side question, what is the /ideal/ resolution filter shape?
> > Should it be flat-topped with cliff-like sides or more rounded in its
> > shape? On the one hand I imagine that flat-topped is best since this
> > introduces least error if a narrow bandwidth signal if within the

> > passband of the filter but not exactly at the centre, but the more
> > rounded shape helps to ensure that maximum reponse occurs near to the
> > filter's centre frequency so that I get more precise measurements of
> > the frequencies in the signal.
> >
> > Thanks
> >
> > Mark
> >
> >
>

7427. Re: [spectrumanalyzer] Resolution filter shape

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-11 05:39:24 UTC
From: william sprowls
Topic: 7420 Message: 7427

Hi Mark,
The perfect filter would peak in the center and look somewhat elliptical within the 3 dB points. Also, the skirts would be very sharp. Almost impossible to have both with one filter.
 Anyway, to answer your main question, calibrate for the exact center of the filter, even if a "dip" is there.
Scotty

--- On Mon, 1/10/11, Mark Burgin <mark@...> wrote:

From: Mark Burgin <mark@...>
Subject: [spectrumanalyzer] Resolution filter shape
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Monday, January 10, 2011, 5:06 PM

Hi EveryoneAt the moment, I only have a single completed resolution filter with a 7.5KHz nominal bandwidth. It uses the ITT 024DD MCF from eBay which seems to have the same specs as the QMF 10725 described on Scotty's web site.My problem is with the shape of the filter's response. Its bandwidth (7.9KHz) and insertion loss (about 3dB) are both OK, but my problem is that it has a fair amount of passband ripple. I measure it as about 1.3dB even after tweaking the matching with variable caps. Now this wouldn't be so bad if the maximum of its reponse was in the centre but, unfortunately, there is a bit of a dip in its reponse near to the centre so that its maximum is significantly to the right of centre.How should I calibrate this path? Using the maximum value or the value in the centre of the filter's reponse? Are there any tricks I can try to get the maximum more nearly in the centre?As a side question, what is the ideal resolution filter
shape? Should it be flat-topped with cliff-like sides or more rounded in its shape? On the one hand I imagine that flat-topped is best since this introduces least error if a narrow bandwidth signal if within the passband of the filter but not exactly at the centre, but the more rounded shape helps to ensure that maximum reponse occurs near to the filter's centre frequency so that I get more precise measurements of the frequencies in the signal.ThanksMark

7428. Re: [spectrumanalyzer] Resolution filter shape

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-11 15:27:36 UTC
From: Geoff Moore
Topic: 7420 Message: 7428

As well as tweaking the caps on the matching network, I'll assume that you are using a L network, you could try adjusting the L. Difficult if you are using SMD chips but I am using some FT23-61 cores so it is easy to wind a couple of turns more than the computer prog suggests and then remove one at a time until the best match is found. I use the program mini Ring core Calculator from DL5SWB to calculate the turns initially.
Also, the Z on each side of the filter will be different and neither will be 50 ohms.

Geoff

7429. building the resolution filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-11 16:14:01 UTC
From: Geoff
Topic: 7429 Message: 7429

Just over a year ago, many of us took advantage of the very generous offer to obtain the sets of crystals to build the resolution filters.
Scotty followed this up with a note describing the nature of the crystals together with a warning concerning the fragility of the leads. These leads are very delicate and WILL break if you try to bend them more than once. Just very carefully straighten them and then solder them onto the board. Believe me, I broke two leads on my first attempt but managed to solder through the plated through holes to rescue the filter.

The excellent program Dishal 203 will guide you through the design stage but assumes that all crystals are the exactly same so be prepared to experiment with values. I used at least two caps for each value, one at about 75-80% of the target value and the other selected on test. To make it easier to change the caps, I solder two short pieces of wire (scraps from wire ended resistors) at each location and solder the C's to these until I get the best result. Then remove the wires and solder the SAME C's in their final place. You have in effect eleven C's and two L's to play with so be prepared to spend some time to get it right. The computer program will give you the filter impedance but do not assume that the circuits connected to the filter are 50 ohm, they will be close but will require tweaking to get the response correct.
I found that the maximum bandwidth that Dishal designs for is about 7kHz so I am going to have to resort to commercial units to get the wider bandwidths. I haven't built the very narrow filter yet but I am aiming for about 500Hz. If anyone knows if greater bandwidths can be obtained using the sets supplied, please pass on how it can be done.

Good luck

Geoff

7430. Re: Resolution filter shape

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-11 22:07:30 UTC
From: Sam
Topic: 7420 Message: 7430

I posted a reply this morning, but it seems to be lost in the ether.

A possible cause of the dip in the response is under-transformed impedance. For example, if you are trying to match 50 to 2500 ohms, maybe your components are matching 50 to 2000 ohms. This can easily happen even with correct L and C values, if the inductor is low Q. I built two filters with this same MCF and got good results. See my photo album (SamW--RBW Filters).

I wound the inductors on small binocular cores (BN-61-2402) and measured them with the AADE meter. If you already have the MSA up and running with one RBW filter, you can use the MSA itself to measure the inductors (simplest method is to use Component Measure function). Let's say you need more than 3 but less than 3.5 turns. Glue a second core to the first, put 3 turns on the first and try 1-3 half turns on the second. This gives you more fine-tuning than a single core. (A half turn on an empty core gives much less inductance than a half turn on one that already has 3 turns.)

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Geoff Moore" <m0ore@...> wrote:
>
> As well as tweaking the caps on the matching network, I'll assume that you are using a L network, you could try adjusting the L. Difficult if you are using SMD chips but I am using some FT23-61 cores so it is easy to wind a couple of turns more than the computer prog suggests and then remove one at a time until the best match is found. I use the program mini Ring core Calculator from DL5SWB to calculate the turns initially.
> Also, the Z on each side of the filter will be different and neither will be 50 ohms.
>
> Geoff
>

7431. Re: building the resolution filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-11 23:03:02 UTC
From: Sam
Topic: 7429 Message: 7431

As you say, the Dishal design is great below about 7 kHz but not so good above that. The good news is that you can build a very simple 61 kHz bandwidth filter by cascading two ceramic filters, as shown here:

<http://groups.yahoo.com/group/spectrumanalyzer/photos/album/271352628/pic/471013266/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc.>

That image was taken using resistive impedance matching to 330 ohms, but of course you would want to use LC matching. If you had filters of 500 Hz, 7.5 kHz, 61 kHz, and something in the area of 300-1000 kHz, you would have a nice filter selection. Something in the 300-500 kHz range could also be simply done with ceramics, as shown in the same photo album.

You can to some extent take into account the individual crystal characteristics in the Dishal design. It has been a while since I played with it, but there is even a way to adjust for off-frequency crystals, but I could only figure out how to do it for the first and last crystals in the ladder. Once you have the basic design, you can simulate it in RFSim99 using the actual characteristics of the individual crystals, and tweak capacitor values as desired.

Creating the RFSim file is a bit of a pain, because it only allows limited precision, so you have to create two series inductors for each Lm and two parallel capacitors for each Cm, and use one of them to set the final decimal positions. I created such a file, which I thought I posted, but in fact I posted only a graphic image of the simulation results. That was in XtalFilt2.zip in the Files section. I have now added the actual .cct file (the RFSim99 format) to that zip file.

Even with all of that, your actual capacitors won't match the theoretical values, so you need some tuning ability. You could do that with tiny variable caps; when you are done you could remove and measure them, and replace them with fixed caps.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Geoff" <m0ore@...> wrote:
>
> Just over a year ago, many of us took advantage of the very generous offer to obtain the sets of crystals to build the resolution filters.
> Scotty followed this up with a note describing the nature of the crystals together with a warning concerning the fragility of the leads. These leads are very delicate and WILL break if you try to bend them more than once. Just very carefully straighten them and then solder them onto the board. Believe me, I broke two leads on my first attempt but managed to solder through the plated through holes to rescue the filter.
>
> The excellent program Dishal 203 will guide you through the design stage but assumes that all crystals are the exactly same so be prepared to experiment with values. I used at least two caps for each value, one at about 75-80% of the target value and the other selected on test. To make it easier to change the caps, I solder two short pieces of wire (scraps from

wire ended resistors) at each location and solder the C's to these until I get the best result. Then remove the wires and solder the SAME C's in their final place. You have in effect eleven C's and two L's to play with so be prepared to spend some time to get it right. The computer program will give you the filter impedance but do not assume that the circuits connected to the filter are 50 ohm, they will be close but will require tweaking to get the response correct.
> I found that the maximum bandwidth that Dishal designs for is about 7kHz so I am going to have to resort to commercial units to get the wider bandwidths. I haven't built the very narrow filter yet but I am aiming for about 500Hz. If anyone knows if greater bandwidths can be obtained using the sets supplied, please pass on how it can be done.
>
> Good luck
>
> Geoff
>

7432. MOSFET

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-12 03:13:00 UTC
From: Dwi Hartanto
Topic: 7432 Message: 7432

Dear all,

If anyone need BLF369 I have several pieces.

I don't have time to experiment on them anymore and i'd like to sell them
@$250pcs each (negotiable)

Date code : 0724

Brand : NXP

Condition : New.

Payment via Paypall.

If anyone interested please contact me directly via email.

Regards,

Dwi Hartanto

7434. Re: Resolution filter shape

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-12 21:46:01 UTC
From: undercoupled
Topic: 7420 Message: 7434

Hi Mark,

If your filter is OK but just needs matching, you might be interested in this video showing what matching can do for a similar filter.
<http://www.youtube.com/watch?v=3DC8wUUngmxew>
Credits to Paul Kiciak (N2PK), Dave Roberts (G8KBB), and produced by Roderick Wall (VK3YC)

Jerry

--- In spectrumanalyzer@yahoogroups.com, Mark Burgin <mark@...> wrote:
>
> Hi Everyone
> At the moment, I only have a single completed resolution filter with a 7.5KHz nominal bandwidth. It uses the ITT 024DD MCF from eBay which seems to have the same specs as the QMF 10725 described on Scotty's web site.
> My problem is with the shape of the filter's response. Its bandwidth (7.9KHz) and insertion loss (about 3dB) are both OK, but my problem is that it has a fair amount of passband ripple. I measure it as about 1.3dB even after tweaking the matching with variable caps. Now this wouldn't be so bad if the maximum of its reponse was in the centre but, unfortunately, there is a bit of a dip in its reponse near to the centre so that its maximum is significantly to the right of centre.
> How should I calibrate this path? Using the maximum value or the value in the centre of the filter's reponse? Are there any tricks I can try to get the maximum more nearly in the centre?
> As a side question, what is the ideal resolution filter shape? Should it be flat-topped with cliff-like sides or more rounded in its shape? On the one hand I imagine that flat-topped is best since this introduces least error if a narrow bandwidth signal if within the passband of the filter but not exactly at the centre, but the more rounded shape helps to ensure that maximum reponse occurs near to the filter's centre frequency so that I get more precise measurements of the frequencies in the signal.
> Thanks
> Mark
>

7435. RE: [spectrumanalyzer] Re: Resolution filter shape

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-12 22:49:18 UTC
From: Mark Burgin
Topic: 7420 Message: 7435

Thanks for the suggestions, everyone.
I had a look at the video, Jerry, and it is quite a dramatic improvement (incidently, the link didn't work for me but I found it on YouTube anyway).
I have already tried to match the filter's input and output as well as I can. I ended up with a 3uH inductor and shunt 68pF plus 4-25pF variable caps. I found that I could minimize the ripple at a point within the adjustment range of the variable capacitors, but could never get rid of the dip near the centre of the response. I haven't tried to vary the inductors since these are just fixed value SMDs. Since I have "tuned" the response using the caps, is it necessary to be able to adjust the inductors as well? I guess that only when both the capacitors and inductors are correct will they resonate at the right frequency and produce the right impedence transformation. But would it make a noticeable difference if I altered the Ls as well?
Mark

From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of undercoupled
Sent: 12 January 2011 21:46
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Re: Resolution filter shape

Hi Mark,

If your filter is OK but just needs matching, you might be interested in this video showing what matching can do for a similar filter.
<http://www.youtube.com/watch?v=3DC8wUUngmxew>
Credits to Paul Kiciak (N2PK), Dave Roberts (G8KBB), and produced by Roderick Wall (VK3YC)

Jerry

--- In spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>, Mark Burgin <mark@...> wrote:
>
> Hi Everyone
> At the moment, I only have a single completed resolution filter with a 7.5KHz nominal bandwidth. It uses the ITT 024DD MCF from eBay which seems to have the same specs as the QMF 10725 described on Scotty's web site.
> My problem is with the shape of the filter's response. Its bandwidth (7.9KHz) and insertion loss (about 3dB) are both OK, but my problem is that it has a fair amount of passband ripple. I measure it as about 1.3dB even after tweaking the matching with variable caps. Now this wouldn't be so bad if the maximum of its reponse was in the centre but, unfortunately, there is a bit of a dip in its reponse near to the centre so that its maximum is significantly to the right of centre.
> How should I calibrate this path? Using the maximum value or the value in the centre of the filter's reponse? Are there any tricks I can try to get the maximum more nearly in the centre?
> As a side question, what is the ideal resolution filter shape? Should it be flat-topped

with cliff-like sides or more rounded in its shape? On the one hand I imagine that flat-topped is best since this introduces least error if a narrow bandwidth signal if within the passband of the filter but not exactly at the centre, but the more rounded shape helps to ensure that maximum reponse occurs near to the filter's centre frequency so that I get more precise measurements of the frequencies in the signal.
> Thanks
> Mark
>

7436. RE: [spectrumanalyzer] Re: Resolution filter shape

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-13 00:33:44 UTC
From: william sprowls
Topic: 7420 Message: 7436

Hi Mark,
Yes, changing the L might make a fair amount of difference. Don't tell anybody I told you this, but place a small magnet near the inductor to make in change a little. Shhhhh!
Scotty

--- On Wed, 1/12/11, Mark Burgin <mark@...> wrote:

From: Mark Burgin <mark@...>
Subject: RE: [spectrumanalyzer] Re: Resolution filter shape
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Wednesday, January 12, 2011, 4:49 PM

Thanks for the suggestions, everyone. I had a look at the video, Jerry, and it is quite a dramatic improvement (incidently, the link didn't work for me but I found it on YouTube anyway).I have already tried to match the filter's input and output as well as I can. I ended up with a 3uH inductor and shunt 68pF plus 4-25pF variable caps. I found that I could minimize the ripple at a point within the adjustment range of the variable capacitors, but could never get rid of the dip near the centre of the response. I haven't tried to vary the inductors since these are just fixed value SMDs. Since I have "tuned" the response using the caps, is it necessary to be able to adjust the inductors as well? I guess that only when both the capacitors and inductors are correct will they resonate at the right frequency and produce the right impedence transformation. But would it make a noticeable difference if I altered the Ls as well?Mark From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of undercoupled
Sent: 12 January 2011 21:46
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Re: Resolution filter shape   Hi Mark,

If your filter is OK but just needs matching, you might be interested in this video showing what matching can do for a similar filter.
<http://www.youtube.com/watch?v=3DC8wUUngmxew>
Credits to Paul Kiciak (N2PK), Dave Roberts (G8KBB), and produced by Roderick Wall (VK3YC)

Jerry

--- In spectrumanalyzer@yahoogroups.com, Mark Burgin <mark@...> wrote:
>
> Hi Everyone
> At the moment, I only have a single completed resolution filter with a 7.5KHz nominal bandwidth. It uses the ITT 024DD MCF from eBay which seems to have the same specs as the QMF 10725 described on Scotty's web site.
> My problem is with the shape of the filter's response. Its bandwidth (7.9KHz) and insertion loss (about 3dB) are both OK, but my problem is that it has a fair amount of passband ripple. I measure it as about 1.3dB even after tweaking the matching with variable caps. Now this wouldn't be so bad if the maximum of its reponse was in the centre but,

unfortunately, there is a bit of a dip in its reponse near to the centre so that its maximum is significantly to the right of centre.
> How should I calibrate this path? Using the maximum value or the value in the centre of the filter's reponse? Are there any tricks I can try to get the maximum more nearly in the centre?
> As a side question, what is the ideal resolution filter shape? Should it be flat-topped with cliff-like sides or more rounded in its shape? On the one hand I imagine that flat-topped is best since this introduces least error if a narrow bandwidth signal if within the passband of the filter but not exactly at the centre, but the more rounded shape helps to ensure that maximum reponse occurs near to the filter's centre frequency so that I get more precise measurements of the frequencies in the signal.
> Thanks
> Mark
>

7437. Re: Resolution filter shape

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-13 02:45:05 UTC
From: undercoupled
Topic: 7420 Message: 7437

I had originally posted a message yesterday about the video on filter matching, but Yahoo bounced my message for some unknown reason. I copied and resent my bounced message, not realizing that Yahoo had mangled the link to the video. So here it is again, hopefully not mangled again.
<http://www.youtube.com/watch?v=C8wUUngmxew>

Jerry

Thanks for the suggestions, everyone.I had a look at the video, Jerry, and it is quite a dramatic improvement (incidently, the link didn't work for me but I found it on YouTube anyway).

7438. Re: Resolution filter shape

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-13 15:43:27 UTC
From: Sam
Topic: 7420 Message: 7438

I forget the matching impedance for that filter, but let's say it is 2500 ohms with shunt 10 pF. If you match with a series L leading to the filter, and then a shunt C, think of it this way: A certain LC combination will create a resistive transform, which ideally would be 50:1 (or 1:50, depending which end you are looking at). You then increase the C value by 10 pF to create the net shunt capacitance. Adjusting C adjusts the net capacitance, but not the underlying resistive transform. If your transform is really 40:1, no amount of adjusting C will change it to 50:1. You have to adjust L to do that.

Even so, it is normally possible to get an accurate enough value of L that you don't need an L adjustment. However, that is difficult if you use SMT inductors to make large impedance transforms. SMT inductors may be 10-15% off the target value (partly due to tolerance, partly due to the fact you normally can't get an off-the shelf inductor with exactly the nominal inductance you want). In addition, SMT inductors generally have Q in the 15-30 range, which can have a dramatic effect when you are making large transformations.

In RFSim99 you can generate the LC components for an impedance match and then change the inductor Q to see what effect it has. When matching 50 ohms to 330 ohms, the Q value is not too critical. When matching 50 ohms to 2500 ohms, a Q of 15 has a dramatic effect and even a Q of 30 has a significant effect. One of the results is that the effective transform may become 50:2000 rather than 50:2500. To compensate for that requires a larger L. Or, use a handmade inductor to get higher Q.

To get an accurate handmade inductor, you can measure the inductance with the MSA. Even though your current RBW filter is not ideal, it should still do a fine job in VNA modes, so you should get accurate component measurement. So you could use this filter to create the necessary inductors to improve this filter. Seems like that should violate some law of physics.

For a simpler approach, you might just try the next larger size inductor, and see what effect that has. (You should change the inductors on both sides of the filter.) Or, if you have room, add a series inductance of 300 nH or so.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Mark Burgin <mark@...> wrote:
>
> Thanks for the suggestions, everyone.
> I had a look at the video, Jerry, and it is quite a dramatic improvement (incidently, the link didn't work for me but I found it on YouTube anyway).
> I have already tried to match the filter's input and output as well as I can. I ended up with a 3uH inductor and shunt 68pF plus 4-25pF variable caps. I found that I could minimize the ripple at a point within the adjustment range of the variable capacitors, but could never get rid of the dip near the centre of the response. I haven't tried to vary the inductors since these are just fixed value SMDs. Since I have "tuned" the response using the caps, is it necessary to be able to adjust the inductors as well? I guess that only

when both the capacitors and inductors are correct will they resonate at the right frequency and produce the right impedence transformation. But would it make a noticeable difference if I altered the Ls as well?
> Mark
>
> From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of undercoupled
> Sent: 12 January 2011 21:46
> To: spectrumanalyzer@yahoogroups.com
> Subject: [spectrumanalyzer] Re: Resolution filter shape
>
>
>
> Hi Mark,
>
> If your filter is OK but just needs matching, you might be interested in this video showing what matching can do for a similar filter.
> <http://www.youtube.com/watch?v=3DC8wUUngmxew>
> Credits to Paul Kiciak (N2PK), Dave Roberts (G8KBB), and produced by Roderick Wall (VK3YC)
>
> Jerry
>
> --- In spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>, Mark Burgin <mark@> wrote:
> >
> > Hi Everyone
> > At the moment, I only have a single completed resolution filter with a 7.5KHz nominal bandwidth. It uses the ITT 024DD MCF from eBay which seems to have the same specs as the QMF 10725 described on Scotty's web site.
> > My problem is with the shape of the filter's response. Its bandwidth (7.9KHz) and insertion loss (about 3dB) are both OK, but my problem is that it has a fair amount of passband ripple. I measure it as about 1.3dB even after tweaking the matching with variable caps. Now this wouldn't be so bad if the maximum of its reponse was in the centre but, unfortunately, there is a bit of a dip in its reponse near to the centre so that its maximum is significantly to the right of centre.
> > How should I calibrate this path? Using the maximum value or the value in the centre of the filter's reponse? Are there any tricks I can try to get the maximum more nearly in the centre?
> > As a side question, what is the ideal resolution filter shape? Should it be flat-topped with cliff-like sides or more rounded in its shape? On the one hand I imagine that flat-topped is best since this introduces least error if a narrow bandwidth signal if within the passband of the filter but not exactly at the centre, but the more rounded shape helps to ensure that maximum reponse occurs near to the filter's centre frequency so that I get more precise measurements of the frequencies in the signal.
> > Thanks
> > Mark
> >
>

7439. Re: Resolution filter shape

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-13 16:38:50 UTC
From: Sam
Topic: 7420 Message: 7439

That's a nifty video. I wouldn't mind doing a few of those for the MSA, if I can find the software. There is Windows Media Encoder, but it requires at least XP and it would be more convenient for me to use my computer with 2000. (My XP computer is in my workshop. I have to stand up to use it and the keyboard access is awkward.) Does anyone know of software that would essentially do a continuous screen capture so as to make a movie out of what is occurring on the screen, and would work on Windows 2000?

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "undercoupled" <undercoupled@...> wrote:
>
> I had originally posted a message yesterday about the video on filter matching, but Yahoo bounced my message for some unknown reason. I copied and resent my bounced message, not realizing that Yahoo had mangled the link to the video. So here it is again, hopefully not mangled again.
> <http://www.youtube.com/watch?v=C8wUUngmxew>
>
> Jerry
>
>
> Thanks for the suggestions, everyone.I had a look at the video, Jerry, and it is quite a dramatic improvement (incidently, the link didn't work for me but I found it on YouTube anyway).
>

7440. Printer Port

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-13 16:38:58 UTC
From: Robert Fish
Topic: 237 Message: 7440

Hi Guys,

I am trying to test my newly built control board with the controltest.bas software. It failed and i just remembered why. I had to add an after market I/O card to my new computer to get a parallel port (my computer didn't come with one).
It just occurred to me that I have to tell this new software where to find my parallel port. To make the MSA software work on my computer, the address that I have to put in the Harware Configuration manager is "HEX B900" (without the quotes).

In controltest.bas there are three lines at the beginning of the code:

```
port = hexdec("&H378") 'printer port data address for specific computer
status = hexdec("&H379") 'printer port status address for specific computer
control = hexdec("&H37A") 'printer port command address for specific
computer
```

It is clear to me that somewhere inside the parenthesis I need to add HEX B900. Do I add the same address to all three lines Port, Status and Control (because they are different in the default code).
What do I replace in each set of parenthesis? Everything except the Quotes?

I am not a software guy obviously.

Thanks,

Bob

7441. Re: [spectrumanalyzer] Printer Port

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-13 16:43:55 UTC
From: D. J. Wang
Topic: 237 Message: 7441

I would try this:

port = hexdec("&B900") 'printer port data address for specific computer
status = hexdec("&B901") 'printer port status address for specific computer
control = hexdec("&B902") 'printer port command address for specific

Port, status and control use different addresses..
DJ

From: Robert Fish <rwfish@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Thu, January 13, 2011 11:38:58 AM
Subject: [spectrumanalyzer] Printer Port

Hi Guys,

I am trying to test my newly built control board with the controltest.bas software. It failed and i just remembered why. I had to add an after market I/O card to my new computer to get a parallel port (my computer didn't come with one).
It just occurred to me that I have to tell this new software where to find my parallel port. To make the MSA software work on my computer, the address that I have to put in the Harware Configuration manager is "HEX B900" (without the quotes).

In controltest.bas there are three lines at the beginning of the code:

port = hexdec("&H378") 'printer port data address for specific computer
status = hexdec("&H379") 'printer port status address for specific computer
control = hexdec("&H37A") 'printer port command address for specific computer

It is clear to me that somewhere inside the parenthesis I need to add HEX B900. Do I add the same address to all three lines Port, Status and Control (because they are different in the default code).
What do I replace in each set of parenthesis? Everything except the Quotes?

I am not a software guy obviously.

Thanks,

Bob

7442. Re: [spectrumanalyzer] Printer Port

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-13 16:48:00 UTC
From: D. J. Wang
Topic: 237 Message: 7442

Sorry I forgot the "H"..

port = hexdec("&HB900") 'printer port data address for specific computer
status = hexdec("&HB901") 'printer port status address for specific computer
control = hexdec("&HB902") 'printer port command address for specific

---
From: Robert Fish <rwfish@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Thu, January 13, 2011 11:38:58 AM
Subject: [spectrumanalyzer] Printer Port

Hi Guys,

I am trying to test my newly built control board with the controltest.bas software. It failed and i just remembered why. I had to add an after market I/O card to my new computer to get a parallel port (my computer didn't come with one).
It just occurred to me that I have to tell this new software where to find my parallel port. To make the MSA software work on my computer, the address that I have to put in the Harware Configuration manager is "HEX B900" (without the quotes).

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It is clear to me that somewhere inside the parenthesis I need to add HEX B900. Do I add the same address to all three lines Port, Status and Control (because they are different in the default code).
What do I replace in each set of parenthesis? Everything except the Quotes?

I am not a software guy obviously.

Thanks,

Bob

7443. Re: [spectrumanalyzer] Re: Resolution filter shape

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-13 16:57:24 UTC
From: Jurgen
Topic: 7420 Message: 7443

I cant find it. Can you let me have the link.

Thanks, Jurgen

On 1/13/2011 11:38 AM, Sam wrote:
>
> That's a nifty video. I wouldn't mind doing a few of those for the
> MSA, if I can find the software. There is Windows Media Encoder, but
> it requires at least XP and it would be more convenient for me to use
> my computer with 2000. (My XP computer is in my workshop. I have to
> stand up to use it and the keyboard access is awkward.) Does anyone
> know of software that would essentially do a continuous screen capture
> so as to make a movie out of what is occurring on the screen, and
> would work on Windows 2000?
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "undercoupled"
> <undercoupled@...> wrote:
> >
> > I had originally posted a message yesterday about the video on
> filter matching, but Yahoo bounced my message for some unknown reason.
> I copied and resent my bounced message, not realizing that Yahoo had
> mangled the link to the video. So here it is again, hopefully not
> mangled again.
> > <http://www.youtube.com/watch?v=C8wUUngmxew>
> >
> > Jerry
> >
> >
> > Thanks for the suggestions, everyone.I had a look at the video,
> Jerry, and it is quite a dramatic improvement (incidently, the link
> didn't work for me but I found it on YouTube anyway).
> >
>
>

7444. Re: Printer Port

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-13 18:36:27 UTC
From: Sam
Topic: 237 Message: 7444

That should work. I might also add that the beta software contains a built-in control board tester (Setup->Special Tests->LPT Port Test) that allows testing individual bits and also allows you to specify the port's base address (B900 in this case). That software is in the Files section (MSA_Version116...).

This tester controls the state of the parallel port lines. To change a latch bit, you need to change the appropriate data line (D0-D7) and then set to one the line that controls the latch enable signals; those lines are labeled Sel (Latch 1), Init (Latch 2), Auto (Latch 3) and Strobe(Latch 4). Or you can just leave the latch enable lines high while you mess with D0-D7.

When changing individual bits, beware of shorting two adjacent bits with your probe, because a high output shorted to a low output can burn out a bit.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "D. J. Wang" <dj_wang@...> wrote:
>
> Sorry I forgot the "H"..
>
> port = hexdec("&HB900") 'printer port data address for specific computer
> status = hexdec("&HB901") 'printer port status address for specific computer
> control = hexdec("&HB902") 'printer port command address for specific
>
>
>
>
>
> _____
> From: Robert Fish <rwfish@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Thu, January 13, 2011 11:38:58 AM
> Subject: [spectrumanalyzer] Printer Port
>
>
> Hi Guys,
>
> I am trying to test my newly built control board with the
> controltest.bas software. It failed and i just remembered why. I had to
> add an after market I/O card to my new computer to get a parallel port
> (my computer didn't come with one).
> It just occurred to me that I have to tell this new software where to
> find my parallel port. To make the MSA software work on my computer, the
> address that I have to put in the Harware Configuration manager is "HEX
> B900" (without the quotes).
>

```
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> computer
>
> It is clear to me that somewhere inside the parenthesis I need to add
> HEX B900. Do I add the same address to all three lines Port, Status and
> Control (because they are different in the default code).
> What do I replace in each set of parenthesis? Everything except the Quotes?
>
> I am not a software guy obviously.
>
> Thanks,
>
> Bob
>
```

7445. Re: [spectrumanalyzer] Printer Port

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-13 19:04:28 UTC
From: Robert Fish
Topic: 237 Message: 7445

Hi D.J. & Sam,

Looks like that worked. Thanks alot. I will take a look at the beta software and see if it passes my new Control Board.

Thanks Guys,

Bob

> Sorry I forgot the "H"..
>
> port = hexdec("&HB900") 'printer port data address for specific computer
> status = hexdec("&HB901") 'printer port status address for specific
> computer
> control = hexdec("&HB902") 'printer port command address for specific
>
>
> *From:* Robert Fish <rwfish@...>
> *To:* spectrumanalyzer@yahoogroups.com
> *Sent:* Thu, January 13, 2011 11:38:58 AM
> *Subject:* [spectrumanalyzer] Printer Port
>
> Hi Guys,
>
> I am trying to test my newly built control board with the
> controltest.bas software. It failed and i just remembered why. I had to
> add an after market I/O card to my new computer to get a parallel port
> (my computer didn't come with one).
> It just occurred to me that I have to tell this new software where to
> find my parallel port. To make the MSA software work on my computer, the
> address that I have to put in the Harware Configuration manager is "HEX
> B900" (without the quotes).
>
> In controltest.bas there are three lines at the beginning of the code:
>
> port = hexdec("&H378") 'printer port data address for specific computer
> status = hexdec("&H379") 'printer port status address for specific
> computer
> control = hexdec("&H37A") 'printer port command address for specific
> computer
>
> It is clear to me that somewhere inside the parenthesis I need to add
> HEX B900. Do I add the same address to all three lines Port, Status and
> Control (because they are different in the default code).
> What do I replace in each set of parenthesis? Everything except the
> Quotes?

>
> I am not a software guy obviously.
>
> Thanks,
>
> Bob
>
>
>

7446. Re: [spectrumanalyzer] Re: Printer Port

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-13 20:10:14 UTC
From: Geoff Moore
Topic: 237 Message: 7446

>When changing individual bits, beware of shorting two adjacent bits with
>your probe, because a high output >shorted to a low output can burn out a
>bit.

>Sam W.

It's a long time since I did these tests but to prevent any mishaps, I made up a very simple "tool" consisting of a spare connector fitted with LED's with current limit resistors to be plugged into each connector, P1 to P4, in turn.
This enabled the status on all 8 lines to be monitored at the same time. The tester has since been dismantled and the LED's etc returned to "stores" box.

Geoff

7447. Bargain?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-15 02:17:26 UTC
From: Robert Fish
Topic: 7447 Message: 7447

Hi Guys,

The other day I was putting together a parts order for the two DDS SLIM's so the parts will be here when I get to those modules.
When I tried to order the AD9850 chips, Digikey said they were on backorder and there would be a wait. It wasn't terrible, I think it was 3 weeks or something. Just for kicks, I jumped over to EBAY to see if there was anybody selling them there. There were several folks selling 9850's there and the price was about 20 or 25 bucks, same ballpark as Digikey. Then I noticed one seller selling them for $5.99. At first, I thought it was an auction that hadn't ended yet. But no, that is the asking price. The guy states that it might take a month for delivery.
He is in China. I said, "what the heck" and ordered two of them. This was a week ago. They arrived today, brand new cut off of a tape and reel or whatever you call it.
What do you guys think ? Is there a such thing as bootleg chips? I wonder if they work.

Here is the link:

http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=140493448505&ssPageName=STRK:MEWNX:IT

I'm going to give them a shot and see if they work. They either work or they don't, right? or can they under perform, noisy maybe?

Sorry for the long post,

Bob

7448. Re: [spectrumanalyzer] Bargain?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-15 02:34:48 UTC
From: Scott Burris
Topic: 7447 Message: 7448

I've gotten some bargains like this on Analog Devices chips
before, but some were obviously obtained by someone through
a free sample program and resold. They seem to work fine, but
the ethics of doing that are a little suspect.

From the wording of how long it takes to "prepare" the chips,
it almost sounds like they are pulling them off scrap boards and
then sending them out, but if they look like cut tape, I guess that's
not the case. Sparkfun got burned on some bogus Atmel chips
recently, so yes there are bootlegs:

http://www.sparkfun.com/news/350
http://www.sparkfun.com/news/384

Scott

From: Robert Fish <rwfish@...>
To: spectrumanalyzer@yahoogroups.com; rwfish@...
Sent: Fri, January 14, 2011 6:17:26 PM
Subject: [spectrumanalyzer] Bargain?

Hi Guys,

The other day I was putting together a parts order for the two DDS
SLIM's so the parts will be here when I get to those modules.
When I tried to order the AD9850 chips, Digikey said they were on
backorder and there would be a wait. It wasn't terrible, I think
it was 3 weeks or something. Just for kicks, I jumped over to EBAY to
see if there was anybody selling them there. There were several
folks selling 9850's there and the price was about 20 or 25 bucks, same
ballpark as Digikey. Then I noticed one seller selling them for
$5.99. At first, I thought it was an auction that hadn't ended yet. But
no, that is the asking price. The guy states that it might take a month
for delivery.
He is in China. I said, "what the heck" and ordered two of them. This
was a week ago. They arrived today, brand new cut off of a tape and reel
or whatever you call it.
What do you guys think ? Is there a such thing as bootleg chips? I
wonder if they work.

Here is the link:

http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=140493448505&ssPageName=STRK:MEWNX:IT

I'm going to give them a shot and see if they work. They either work or
they don't, right? or can they under perform, noisy maybe?

Sorry for the long post,

Bob

Yahoo! Groups Links

7449. Re: [spectrumanalyzer] Bargain?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-15 04:50:58 UTC
From: Dj_Wang
Topic: 7447 Message: 7449

Hi Bob,
I bought 5 AD9850 from a Taiwanese vendor on eBay few month ago, it is probably the same guy. I think he is still selling them at 5 for $18.99 plus $3 shipping.
DJ

Sent from my iPhone

On Jan 14, 2011, at 9:17 PM, Robert Fish <rwfish@...> wrote:

Hi Guys,

The other day I was putting together a parts order for the two DDS SLIM's so the parts will be here when I get to those modules.
When I tried to order the AD9850 chips, Digikey said they were on backorder and there would be a wait. It wasn't terrible, I think it was 3 weeks or something. Just for kicks, I jumped over to EBAY to see if there was anybody selling them there. There were several folks selling 9850's there and the price was about 20 or 25 bucks, same ballpark as Digikey. Then I noticed one seller selling them for $5.99. At first, I thought it was an auction that hadn't ended yet. But no, that is the asking price. The guy states that it might take a month for delivery.
He is in China. I said, "what the heck" and ordered two of them. This was a week ago. They arrived today, brand new cut off of a tape and reel or whatever you call it.
What do you guys think ? Is there a such thing as bootleg chips? I wonder if they work.

Here is the link:

http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=140493448505&ssPageName=STRK:MEWNX:IT

I'm going to give them a shot and see if they work. They either work or they don't, right? or can they under perform, noisy maybe?

Sorry for the long post,

Bob

7450. Re: Bargain?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-15 09:49:40 UTC
From: Ron
Topic: 7447 Message: 7450

I bought 5 for a similar price about a year ago. They were listed as "used" but I doubt they were. They looked clean and were mounted in tape. I have used them in my MSA. One drew about double the supply current so I changed it (10 ohm to 78M05 getting warm). Still have two spare. My MSA is working fine.

Ron, VK7ZRO.

--- In spectrumanalyzer@yahoogroups.com, Dj_Wang <dj_wang@...> wrote:
>
> Hi Bob,
> I bought 5 AD9850 from a Taiwanese vendor on eBay few month ago, it is probably the same guy. I think he is still selling them at 5 for $18.99 plus $3 shipping.
> DJ

7451. Re: [spectrumanalyzer] Bargain?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-15 10:13:25 UTC
From: Dan Andersson
Topic: 7447 Message: 7451

As Scott wrote,

buying two's might be buying "free samples". I don't think AD have any "free" AD9850's anymore as they don't like us doing new designs with them. They are kindof obsolete or at least going towards EOL (and unethical...)

However!

Samples are often lacking the final production stage of "tempering".

They must be baked for 24 ours in125 degrees centigrades.

AD's wording: "Failure to comply may result in crack nd/or delamination of critical interfaces within the package. Reference IPC/JEDEC J-STD-033 for additional information."

Treat your chips as "samples", just in case, and bake them accordingly before you solder them.

Cheers

//Dan, M0DFI

On Saturday 15 January 2011 02:34:48 you wrote:
> I've gotten some bargains like this on Analog Devices chips
> before, but some were obviously obtained by someone through
> a free sample program and resold. They seem to work fine, but
> the ethics of doing that are a little suspect.
>
> From the wording of how long it takes to "prepare" the chips,
> it almost sounds like they are pulling them off scrap boards and
> then sending them out, but if they look like cut tape, I guess that's
> not the case. Sparkfun got burned on some bogus Atmel chips
> recently, so yes there are bootlegs:
>
> http://www.sparkfun.com/news/350
> http://www.sparkfun.com/news/384
>
> Scott
>
>
>
>
> _____
> From: Robert Fish <rwfish@...>
> To: spectrumanalyzer@yahoogroups.com; rwfish@...
> Sent: Fri, January 14, 2011 6:17:26 PM

> Subject: [spectrumanalyzer] Bargain?
>
> Hi Guys,
>
> The other day I was putting together a parts order for the two DDS
> SLIM's so the parts will be here when I get to those modules.
> When I tried to order the AD9850 chips, Digikey said they were on
> backorder and there would be a wait. It wasn't terrible, I think
> it was 3 weeks or something. Just for kicks, I jumped over to EBAY to
> see if there was anybody selling them there. There were several
> folks selling 9850's there and the price was about 20 or 25 bucks, same
> ballpark as Digikey. Then I noticed one seller selling them for
> $5.99. At first, I thought it was an auction that hadn't ended yet. But
> no, that is the asking price. The guy states that it might take a month
> for delivery.
> He is in China. I said, "what the heck" and ordered two of them. This
> was a week ago. They arrived today, brand new cut off of a tape and reel
> or whatever you call it.
> What do you guys think ? Is there a such thing as bootleg chips? I
> wonder if they work.
>
> Here is the link:
>
> http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=140493448505&ssPageName=
> STRK:MEWNX:IT
>
>
> I'm going to give them a shot and see if they work. They either work or
> they don't, right? or can they under perform, noisy maybe?
>
> Sorry for the long post,
>
> Bob
>
>
>
> ---
>
> Yahoo! Groups Links

7452. Re: [spectrumanalyzer] 116 beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-15 15:33:40 UTC
From: Jim Hontoria
Topic: 7422 Message: 7452

Sam,
It appears that the software calls msadll.dll even when the USB interface is not selected in the hardware setup. If running with the parallel interface with msadll.dll present in the directory AND the USB interface not plugged in, this results in an error message. If msadll.dll is not present in the directory (or is renamed) then everything is OK. Not too serious unless msadll is read regardless it is needed or not.

BTW, are you running USB with the control; board or do you go directly to the SLIMs ? I tried to go to the SLIMs directly and couldn't get it to work, I am going back temporarily to parallel; I may have messed the hardware..

Jim W1JGH

On Mon, Jan 10, 2011 at 4:03 PM, Sam <swetterlin@...> wrote:

>
>
> I posted a new version of the beta version 116 software in the Files
> section at:
>
> <
> http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_version116_4d_Beta.zip
> >
>
> This fixes a couple of irritating bugs--one with saving files and one with
> the Filter Analysis function. It also contains a new test routine created by
> Scotty for scanning/tuning the cavity filter without having to tinker with
> cables, which isn't documented yet but will be when any kinks are ironed
> out.
>
> Sam W.
>
>
>

--
Jim G. Hontoria

7453. Re: [spectrumanalyzer] Re: Bargain?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-15 16:38:24 UTC
From: Robert Fish
Topic: 7447 Message: 7453

Sounds like this price isn't unheard of. I am nearly certain that they
aren't used. Looks like I found a bargain
I hope they work.

Thanks for the replies,

Bob

> I bought 5 for a similar price about a year ago. They were listed as
> "used" but I doubt they were. They looked clean and were mounted in
> tape. I have used them in my MSA. One drew about double the supply
> current so I changed it (10 ohm to 78M05 getting warm). Still have two
> spare. My MSA is working fine.
>
> Ron, VK7ZRO.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Dj_Wang <dj_wang@...> wrote:
> >
> > Hi Bob,
> > I bought 5 AD9850 from a Taiwanese vendor on eBay few month ago, it
> is probably the same guy. I think he is still selling them at 5 for
> $18.99 plus $3 shipping.
> > DJ
>
>

7454. Version 116 Beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-15 17:41:03 UTC
From: wsprowls
Topic: 7454 Message: 7454

Hi All,
For those of you who are trying out the Version 116 Beta software, there are a couple of new features in the Special Tests Window.
1. Testing the LPT Port on the Computer. This will replace the old LPT code I have been passing around. Much simpler to use. Here is a page on how to use it:
http://www.scottyspectrumanalyzer.com/special_lpt.html

2. Testing the Cavity Filter without having to disconnect any cables. Really nice (if I do say so myself). Here is the description page:
http://www.scottyspectrumanalyzer.com/special_cavitytest.html

Cheers,
Scotty

7455. Re: [spectrumanalyzer] Version 116 Beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-15 19:04:07 UTC
From: SFC
Topic: 7454 Message: 7455

Hi

I've been using the new cavity filter tuner and it's great. A very clever use of soft and hardware!
However I noticed one flaw, maybe it's me, but the filter analysis function crashes the program. I've tried the "B" version but is has the same problem. Something to do with a #handle 'color' ?

Regards,

Simon

----- Original Message -----
From: wsprowls
To: spectrumanalyzer@yahoogroups.com
Sent: Saturday, January 15, 2011 6:41 PM
Subject: [spectrumanalyzer] Version 116 Beta

Hi All,
For those of you who are trying out the Version 116 Beta software, there are a couple of new features in the Special Tests Window.
1. Testing the LPT Port on the Computer. This will replace the old LPT code I have been passing around. Much simpler to use. Here is a page on how to use it:
http://www.scottyspectrumanalyzer.com/special_lpt.html

2. Testing the Cavity Filter without having to disconnect any cables. Really nice (if I do say so myself). Here is the description page:
http://www.scottyspectrumanalyzer.com/special_cavitytest.html

Cheers,
Scotty

_____ NOD32 5789 (20110115) Informatie _____

Dit bericht is gecontroleerd door het NOD32 Antivirus Systeem.
http://www.nod32.nl

7456. Re: [spectrumanalyzer] Version 116 Beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-15 21:58:37 UTC
From: SFC
Topic: 7454 Message: 7456

Hi,

Found a fix, added .g to handle in this line:

if twoPortWinHndl$="" then gBox$="#handle.g" else graphBox$="#twoPortGraphBox" 'main win or two port win 'ver116-4c

Simon

----- Original Message -----
From: SFC
To: spectrumanalyzer@yahoogroups.com
Sent: Saturday, January 15, 2011 8:04 PM
Subject: Re: [spectrumanalyzer] Version 116 Beta

Hi

I've been using the new cavity filter tuner and it's great. A very clever use of soft and hardware!
However I noticed one flaw, maybe it's me, but the filter analysis function crashes the program. I've tried the "B" version but is has the same problem. Something to do with a #handle 'color' ?

Regards,

Simon

----- Original Message -----
From: wsprowls
To: spectrumanalyzer@yahoogroups.com
Sent: Saturday, January 15, 2011 6:41 PM
Subject: [spectrumanalyzer] Version 116 Beta

Hi All,
For those of you who are trying out the Version 116 Beta software, there are a couple of new features in the Special Tests Window.
1. Testing the LPT Port on the Computer. This will replace the old LPT code I have been passing around. Much simpler to use. Here is a page on how to use it:
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2. Testing the Cavity Filter without having to disconnect any cables. Really nice (if I do say so myself). Here is the description page:
http://www.scottyspectrumanalyzer.com/special_cavitytest.html

Cheers,
Scotty

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http://www.nod32.nl

7457. Re: Version 116 Beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-16 00:31:18 UTC
From: Sam
Topic: 7454 Message: 7457

Adding the .g to #handle is correct. I thought I had fixed that. Strange. In your text, the reference to graphBox$ should be gBox$, which is how the code reads.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "SFC" <sf-cillari@...> wrote:
>
> Hi,
>
> Found a fix, added .g to handle in this line:
>
> if twoPortWinHndl$="" then gBox$="#handle.g" else graphBox$="#twoPortGraphBox" 'main win or two port win 'ver116-4c
>
> Simon
>
>
> ----- Original Message -----
> From: SFC
> To: spectrumanalyzer@yahoogroups.com
> Sent: Saturday, January 15, 2011 8:04 PM
> Subject: Re: [spectrumanalyzer] Version 116 Beta
>
>
>
>
> Hi
>
> I've been using the new cavity filter tuner and it's great. A very clever use of soft and hardware!
> However I noticed one flaw, maybe it's me, but the filter analysis function crashes the program. I've tried the "B" version but is has the same problem. Something to do with a #handle 'color' ?
>
> Regards,
>
> Simon
>
>
>
> ----- Original Message -----
> From: wsprowls
> To: spectrumanalyzer@yahoogroups.com
> Sent: Saturday, January 15, 2011 6:41 PM
> Subject: [spectrumanalyzer] Version 116 Beta

>
>
>
> Hi All,
> For those of you who are trying out the Version 116 Beta software, there are a couple of new features in the Special Tests Window.
> 1. Testing the LPT Port on the Computer. This will replace the old LPT code I have been passing around. Much simpler to use. Here is a page on how to use it:
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> 2. Testing the Cavity Filter without having to disconnect any cables. Really nice (if I do say so myself). Here is the description page:
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> Cheers,
> Scotty
>
>
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> http://www.nod32.nl
>

7458. Re: 116 beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-16 01:39:47 UTC
From: Sam
Topic: 7422 Message: 7458

I will have to leave that for Dave Roberts to resolve. I don't actually use USB at the moment and I have steered clear of the details of the USB interface. (I'm all in favor of USB, I just have plenty of other things to deal with.) Some of the initial DLL accesses occur before the configuration file is loaded, so maybe the problem is there.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> Sam,
> It appears that the software calls msadll.dll even when the USB interface is
> not selected in the hardware setup. If running with the parallel
> interface with msadll.dll present in the directory AND the USB interface not
> plugged in, this results in an error message. If msadll.dll is not present
> in the directory (or is renamed) then everything is OK. Not too serious
> unless msadll is read regardless it is needed or not.
>
> BTW, are you running USB with the control; board or do you go directly to
> the SLIMs ? I tried to go to the SLIMs directly and couldn't get it to
> work, I am going back temporarily to parallel; I may have messed the
> hardware..
>
> Jim W1JGH
>
> On Mon, Jan 10, 2011 at 4:03 PM, Sam <swetterlin@...> wrote:
>
> >
> >
> > I posted a new version of the beta version 116 software in the Files
> > section at:
> >
> > <
> > http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_version116_4d_Beta.zip
> > >
> >
> > This fixes a couple of irritating bugs--one with saving files and one with
> > the Filter Analysis function. It also contains a new test routine created by
> > Scotty for scanning/tuning the cavity filter without having to tinker with
> > cables, which isn't documented yet but will be when any kinks are ironed
> > out.
> >
> > Sam W.
> >
> >
> >
>

```
>
>
> --
> Jim G. Hontoria
>
```

7459. Re: [spectrumanalyzer] Re: Version 116 Beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-16 09:53:07 UTC
From: SFC
Topic: 7454 Message: 7459

You're right, in attempt to find the bug I renamed gbox into graphbox and forgot to put it back. I don't know anything about Basic just Assembler so I had to try things....

Simon

----- Original Message -----
From: Sam
To: spectrumanalyzer@yahoogroups.com
Sent: Sunday, January 16, 2011 1:31 AM
Subject: [spectrumanalyzer] Re: Version 116 Beta

Adding the .g to #handle is correct. I thought I had fixed that. Strange. In your text, the reference to graphBox$ should be gBox$, which is how the code reads.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "SFC" <sf-cillari@...> wrote:
>
> Hi,
>
> Found a fix, added .g to handle in this line:
>
> if twoPortWinHndl$="" then gBox$="#handle.g" else graphBox$="#twoPortGraphBox" 'main win or two port win 'ver116-4c
>
> Simon
>
>
> ----- Original Message -----
> From: SFC
> To: spectrumanalyzer@yahoogroups.com
> Sent: Saturday, January 15, 2011 8:04 PM
> Subject: Re: [spectrumanalyzer] Version 116 Beta
>
>
>
>
> Hi
>
> I've been using the new cavity filter tuner and it's great. A very clever use of soft and hardware!
> However I noticed one flaw, maybe it's me, but the filter analysis function crashes the program. I've tried the "B" version but is has the same problem. Something to do with a #handle 'color' ?
>
> Regards,

>
> Simon
>
>
>
> ----- Original Message -----
> From: wsprowls
> To: spectrumanalyzer@yahoogroups.com
> Sent: Saturday, January 15, 2011 6:41 PM
> Subject: [spectrumanalyzer] Version 116 Beta
>
>
>
> Hi All,
> For those of you who are trying out the Version 116 Beta software, there are a couple of new features in the Special Tests Window.
> 1. Testing the LPT Port on the Computer. This will replace the old LPT code I have been passing around. Much simpler to use. Here is a page on how to use it:
> http://www.scottyspectrumanalyzer.com/special_lpt.html
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> 2. Testing the Cavity Filter without having to disconnect any cables. Really nice (if I do say so myself). Here is the description page:
> http://www.scottyspectrumanalyzer.com/special_cavitytest.html
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> Cheers,
> Scotty
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_____ NOD32 5790 (20110115) Informatie _____

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http://www.nod32.nl

7460. Re: [spectrumanalyzer] Re: 116 beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-16 15:04:42 UTC
From: Jim Hontoria
Topic: 7422 Message: 7460

Sam,
1. The Auto-wait checkbox is not available in this version. Also the capacitor values that show on page 3 of the summary changes don't correspond with the schematic.
2. Question: are the video filter capacitor values which are entered in the Hardware Configuration setup table actually used by the program? If that is the case these should be measured values not just the nominals.

Jim W1JGH

On Sat, Jan 15, 2011 at 8:39 PM, Sam <swetterlin@comcast.net> wrote:

>
>
> I will have to leave that for Dave Roberts to resolve. I don't actually use
> USB at the moment and I have steered clear of the details of the USB
> interface. (I'm all in favor of USB, I just have plenty of other things to
> deal with.) Some of the initial DLL accesses occur before the configuration
> file is loaded, so maybe the problem is there.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com<spectrumanalyzer%40yahoogroups.com>,
> Jim Hontoria <jghalpha@...> wrote:
> >
> > Sam,
> > It appears that the software calls msadll.dll even when the USB interface
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> > not selected in the hardware setup. If running with the parallel
> > interface with msadll.dll present in the directory AND the USB interface
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> > in the directory (or is renamed) then everything is OK. Not too serious
> > unless msadll is read regardless it is needed or not.
> >
> > BTW, are you running USB with the control; board or do you go directly to
> > the SLIMs ? I tried to go to the SLIMs directly and couldn't get it to
> > work, I am going back temporarily to parallel; I may have messed the
> > hardware..
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> > Jim W1JGH
> >
> > On Mon, Jan 10, 2011 at 4:03 PM, Sam <swetterlin@...> wrote:
> >
> > >
> > >

> > > I posted a new version of the beta version 116 software in the Files
> > > section at:
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> http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_version116_4d_Beta.zip
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> > >
> > > This fixes a couple of irritating bugs--one with saving files and one
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> created by
> > > Scotty for scanning/tuning the cavity filter without having to tinker
> with
> > > cables, which isn't documented yet but will be when any kinks are
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> > >
> > > Sam W.
> > >
> > >
> > >
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> >
> > --
> > Jim G. Hontoria
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>

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Jim G. Hontoria

7461. Re: 116 beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-16 16:10:38 UTC
From: Sam
Topic: 7422 Message: 7461

Jim
The auto-wait checkbox shows up on mine, and works when I click it. Could you send me a screenshot of your sweep parameters window?

Yes, the schematic values for the video filter were adjusted after the software default values were set. I think I got the default values from Scotty, but I tinkered with them. Everyone should enter the values they actually use. If you are more interested in rapid SA sweeps, you may want to go with smaller capacitors. I'm more interested in smoothing VNA sweeps, so I go with larger capacitors. The software makes use of the capacitor values, but it is not necessary to know their precise values.

Auto-wait watches the readings settle, and decides when the remaining amount of possible settling is too small to bother with, based on the time constants of the capacitors. There is an error factor because the actual wait time between readings is almost always longer than the software thinks, so the amount of settling that occurs in that time interval is greater than it would be if the wait time were more precisely known. This tends to make the software project more future settling than will really occur, so it will frequently wait one time constant longer than it really needs to. So it is being conservative. In this context, a 20% error in the capacitor value is unlikely to cause any harm. On the other hand, if you can easily measure your capacitors, you might as well do so.

Note also that there is some small capacitance in the circuits (e.g. on the PDM board) even if you use no Wide video filter capacitor. The default values of the Wide filter reflect those capacitances (e.g. 0.011 for phase). But the defaults assume 0.1 uF for the Mid filter, and enter it as 0.1 rather than, say, 0.111 for phase (which would include those other capacitors). The difference is not meaningful enough to bother with, and gets confusing. But you can certainly add that extra capacitance to your measured capacitance if you want to be more precise.

So "close" counts in horseshoes, hand-grenades and configuring the capacitor values.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> Sam,
> 1. The Auto-wait checkbox is not available in this version. Also the
> capacitor values that show on page 3 of the summary changes don't correspond
> with the schematic.
> 2. Question: are the video filter capacitor values which are entered in the
> Hardware Configuration setup table actually used by the program? If that is
> the case these should be measured values not just the nominals.
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> Jim W1JGH
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>

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> On Sat, Jan 15, 2011 at 8:39 PM, Sam <swetterlin@...> wrote:
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> > I will have to leave that for Dave Roberts to resolve. I don't actually use
> > USB at the moment and I have steered clear of the details of the USB
> > interface. (I'm all in favor of USB, I just have plenty of other things to
> > deal with.) Some of the initial DLL accesses occur before the configuration
> > file is loaded, so maybe the problem is there.
> > Sam W.
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> > --- In spectrumanalyzer@yahoogroups.com<spectrumanalyzer%40yahoogroups.com>,
> > Jim Hontoria <jghalpha@> wrote:
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> > > Sam,
> > > It appears that the software calls msadll.dll even when the USB interface
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> > > not selected in the hardware setup. If running with the parallel
> > > interface with msadll.dll present in the directory AND the USB interface
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> > > plugged in, this results in an error message. If msadll.dll is not
> > present
> > > in the directory (or is renamed) then everything is OK. Not too serious
> > > unless msadll is read regardless it is needed or not.
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> > > BTW, are you running USB with the control; board or do you go directly to
> > > the SLIMs ? I tried to go to the SLIMs directly and couldn't get it to
> > > work, I am going back temporarily to parallel; I may have messed the
> > > hardware..
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> > > Jim W1JGH
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> > > On Mon, Jan 10, 2011 at 4:03 PM, Sam <swetterlin@> wrote:
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> > > > I posted a new version of the beta version 116 software in the Files
> > > > section at:
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> > http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_version116_4d_Beta.zip
> > > > >
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> > > > This fixes a couple of irritating bugs--one with saving files and one
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> > > > the Filter Analysis function. It also contains a new test routine
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> > > > Scotty for scanning/tuning the cavity filter without having to tinker

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> > > > cables, which isn't documented yet but will be when any kinks are
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> > > > Sam W.
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> > > --
> > > Jim G. Hontoria
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> --
> Jim G. Hontoria
>

7462. Re: [spectrumanalyzer] Re: 116 beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-16 16:54:34 UTC
From: Jim Hontoria
Topic: 7422 Message: 7462
Attachments: 1 described; binary payloads are missing from this source WARC

Hi Sam,
Attached is the Sweep Params window pdf
Jim W1JGH

On Sun, Jan 16, 2011 at 11:10 AM, Sam <swetterlin@...> wrote:

>
>
> Jim
> The auto-wait checkbox shows up on mine, and works when I click it. Could
> you send me a screenshot of your sweep parameters window?
>
> Yes, the schematic values for the video filter were adjusted after the
> software default values were set. I think I got the default values from
> Scotty, but I tinkered with them. Everyone should enter the values they
> actually use. If you are more interested in rapid SA sweeps, you may want to
> go with smaller capacitors. I'm more interested in smoothing VNA sweeps, so
> I go with larger capacitors. The software makes use of the capacitor values,
> but it is not necessary to know their precise values.
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> Auto-wait watches the readings settle, and decides when the remaining
> amount of possible settling is too small to bother with, based on the time
> constants of the capacitors. There is an error factor because the actual
> wait time between readings is almost always longer than the software thinks,
> so the amount of settling that occurs in that time interval is greater than
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7463. Re: 116 beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-16 18:09:59 UTC
From: Sam
Topic: 7422 Message: 7463

Jim,
This probably has to do with the irritating message you mentioned earlier about the cal table being too sparse to use auto wait. I eliminated the message, but auto wait is disabled in that situation. You are probably running with the default path calibration, or an actual calibration that has very few points (auto wait requires at least 5 cal points, as I recall). Auto wait has to adjust to the fact that the bottom, center and top portions of the ADC vs. dBm curve normally have significantly different slopes, so it checks out those areas when a path cal is loaded. You could either do a more full calibration, or just add a few points by rough interpolation or extrapolation.

There are also a few other situations where the software cannot calculate the necessary information if the path cal data is screwy, but those situations should never arise with real calibration data.

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7464. Re: [spectrumanalyzer] Re: 116 beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-16 19:00:27 UTC
From: Jim Hontoria
Topic: 7422 Message: 7464

Hi Sam,
I see your reasoning. I just populated path 1 and I get the AutoWait. BUT it also shows if I switch to P2 and P3 which are not populated.

On another vein: both ADC outputs are always active, I see signals going out for both mag and phase. When the systems wakes up as SA, the Show Variables panel, however, does not show any phase activity. If now I change mode to VNA, I can see phase activity. So far OK. But then, if I return to SA, the pase activity continues. I don't think this is causing any problem other than unnecessary processing while in SA mode.

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7465. Auto Wait

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-16 23:18:16 UTC
From: Sam
Topic: 7013 Message: 7465

Jim
At this moment, Yahoo seems to be in la-la land. My prior message has not yet been posted and it won't let me "reply" to messages. But I assume that message and this will ultimately get through.

Regarding the fact that the auto wait box still appears with your sparse P2 and P3 calibrations. If auto wait is already selected when a new path is loaded, the disabling of auto wait for sparse calibrations doesn't work. I have now fixed that.

Sam W.

7466. Re: [spectrumanalyzer] Re: 116 beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-16 22:12:00 UTC
From: william sprowls
Topic: 7422 Message: 7466

Jim,
When in SA Mode, the Phase bits are read at the same time the Mag bits are read, but not processed. Therefore, no wasted time.
Exception: When in SA Mode and Variables Window is open. Then Phase bits get displayed in the Variables Window but no other processing.
 This was my idea to verify that the Phase bits were working during testing. I left it there for a possible use of the Phase AtoD for applications with the SA without VNA.
Example: a digital voltmeter.
Scotty

--- On Sun, 1/16/11, Jim Hontoria <jghalpha@...> wrote:

From: Jim Hontoria <jghalpha@...>
Subject: Re: [spectrumanalyzer] Re: 116 beta
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, January 16, 2011, 1:00 PM

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> > configuration

> > > > file is loaded, so maybe the problem is there.
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com<spectrumanalyzer%40yahoogroups.com>

> > <spectrumanalyzer%40yahoogroups.com>,
> >

> > > > Jim Hontoria <jghalpha@> wrote:
> > > > >
> > > > > Sam,

> > > > > It appears that the software calls msadll.dll even when the USB
> > interface
> > > > is
> > > > > not selected in the hardware setup. If running with the parallel

> > > > > interface with msadll.dll present in the directory AND the USB
> > interface
> > > > not
> > > > > plugged in, this results in an error message. If msadll.dll is not

> > > > present
> > > > > in the directory (or is renamed) then everything is OK. Not too
> > serious
> > > > > unless msadll is read regardless it is needed or not.

> > > > >
> > > > > BTW, are you running USB with the control; board or do you go
> > directly to
> > > > > the SLIMs ? I tried to go to the SLIMs directly and couldn't get it

> > to
> > > > > work, I am going back temporarily to parallel; I may have messed the
> > > > > hardware..
> > > > >
> > > > > Jim W1JGH
> > > > >

> > > > > On Mon, Jan 10, 2011 at 4:03 PM, Sam <swetterlin@> wrote:
> > > > >
> > > > > >
> > > > > >
> > > > > > I posted a new version of the beta version 116 software in the

> > Files
> > > > > > section at:
> > > > > >
> > > > > > <
> > > > > >
> > > >
> > http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_version116_4d_Beta.zip

> > > > > > >
> > > > > >
> > > > > > This fixes a couple of irritating bugs--one with saving files and
> > one
> > > > with
> > > > > > the Filter Analysis function. It also contains a new test routine

> > > > created by
> > > > > > Scotty for scanning/tuning the cavity filter without having to
> > tinker
> > > > with
> > > > > > cables, which isn't documented yet but will be when any kinks are

> > > > ironed
> > > > > > out.
> > > > > >
> > > > > > Sam W.
> > > > > >
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> > > > > --
> > > > > Jim G. Hontoria
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> > > Jim G. Hontoria
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> Jim G. Hontoria
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Jim G. Hontoria

7467. Cavity bandwith vs RBW filter frequency

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-17 03:23:25 UTC
From: Jim Hontoria
Topic: 7467 Message: 7467

I just built a 1 KHz ladder filter using the 10.11 crystals..If the cavity filter has 2 MHz bandwidth and a center frequency of 1013.3 MHz this allows for an IF of 1024 -1013.3 plus minus 1 MHz.or a margin of 9.7 MHz to 11.7 MHz. This means that my new filter at 10.11 fits right in there and everything should be hunky-dory. Is this the right analysis?

Jim

7468. Re: Cavity bandwith vs RBW filter frequency

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-17 13:51:43 UTC
From: Sam
Topic: 7467 Message: 7468

Exactly. The cavity filter attenuation will be a little higher out near the edge, but that is no big deal.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> I just built a 1 KHz ladder filter using the 10.11 crystals..If the cavity
> filter has 2 MHz bandwidth and a center frequency of 1013.3 MHz this allows
> for an IF of 1024 -1013.3 plus minus 1 MHz.or a margin of 9.7 MHz to 11.7
> MHz. This means that my new filter at 10.11 fits right in there and
> everything should be hunky-dory. Is this the right analysis?
>
>
>
> Jim
>

7469. Re: 116 beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-17 14:03:28 UTC
From: Sam
Topic: 7422 Message: 7469

When I revised the read procedure for Auto Wait, I didn't save the phase readings when in SA mode. (I have now fixed that so it behaves per Scotty's post--phase ADC is saved and displayed in Show Variables, but not used for anything else in VNA mode.) The phase activity Jim saw in the Show Variables window was the display of the phase info left over from the most recent VNA scan, which explains why there was no such activity when he started in SA mode--there was no leftover VNA phase data.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Jim,
> When in SA Mode, the Phase bits are read at the same time the Mag bits are read, but not processed. Therefore, no wasted time.
> Exception: When in SA Mode and Variables Window is open. Then Phase bits get displayed in the Variables Window but no other processing.
> Â This was my idea to verify that the Phase bits were working during testing. I left it there for a possible use of the Phase AtoD for applications with the SA without VNA. Example: a digital voltmeter.
> Scotty
>
> --- On Sun, 1/16/11, Jim Hontoria <jghalpha@...> wrote:
>
> From: Jim Hontoria <jghalpha@...>
> Subject: Re: [spectrumanalyzer] Re: 116 beta
> To: spectrumanalyzer@yahoogroups.com
> Date: Sunday, January 16, 2011, 1:00 PM
>
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>
> Hi Sam,
> I see your reasoning. I just populated path 1 and I get the AutoWait. BUT it also

showsÂ if I switch toÂ P2 and P3 which are not populated.
> Â
> On another vein: both ADC outputs are always active, I see signals going out for both mag and phase. When the systems wakes up asÂ SA, the Show Variables panel, however, does not show any phase activity. If now I change mode to VNA, I can see phase activity. So far OK. But then, if I return to SA, the pase activity continues. I don't think this is causing any problem other than unnecessary processing while in SA mode.
>
> Â
> Just being picky....
> Â
> Jim W1JGH
>
>
> On Sun, Jan 16, 2011 at 1:09 PM, Sam <swetterlin@...> wrote:
>
>
> Â
>
>
>
> Jim,
> This probably has to do with the irritating message you mentioned earlier about the cal table being too sparse to use auto wait. I eliminated the message, but auto wait is disabled in that situation. You are probably running with the default path calibration, or an actual calibration that has very few points (auto wait requires at least 5 cal points, as I recall). Auto wait has to adjust to the fact that the bottom, center and top portions of the ADC vs. dBm curve normally have significantly different slopes, so it checks out those areas when a path cal is loaded. You could either do a more full calibration, or just add a few points by rough interpolation or extrapolation.
>
>
> There are also a few other situations where the software cannot calculate the necessary information if the path cal data is screwy, but those situations should never arise with real calibration data.
>
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@> wrote:
> >
>
> > Hi Sam,
> > Attached is the Sweep Params window pdf
> > Jim W1JGH
> >
>
>
>
> > On Sun, Jan 16, 2011 at 11:10 AM, Sam <swetterlin@> wrote:
> >

> > >
> > >
> > > Jim
> > > The auto-wait checkbox shows up on mine, and works when I click it. Could
>
> > > you send me a screenshot of your sweep parameters window?
> > >
> > > Yes, the schematic values for the video filter were adjusted after the
> > > software default values were set. I think I got the default values from
>
> > > Scotty, but I tinkered with them. Everyone should enter the values they
> > > actually use. If you are more interested in rapid SA sweeps, you may want to
> > > go with smaller capacitors. I'm more interested in smoothing VNA sweeps, so
>
> > > I go with larger capacitors. The software makes use of the capacitor values,
> > > but it is not necessary to know their precise values.
> > >
> > > Auto-wait watches the readings settle, and decides when the remaining
>
> > > amount of possible settling is too small to bother with, based on the time
> > > constants of the capacitors. There is an error factor because the actual
> > > wait time between readings is almost always longer than the software thinks,
>
> > > so the amount of settling that occurs in that time interval is greater than
> > > it would be if the wait time were more precisely known. This tends to make
> > > the software project more future settling than will really occur, so it will
>
> > > frequently wait one time constant longer than it really needs to. So it is
> > > being conservative. In this context, a 20% error in the capacitor value is
> > > unlikely to cause any harm. On the other hand, if you can easily measure
>
> > > your capacitors, you might as well do so.
> > >
> > > Note also that there is some small capacitance in the circuits (e.g. on the
> > > PDM board) even if you use no Wide video filter capacitor. The default
>
> > > values of the Wide filter reflect those capacitances (e.g. 0.011 for phase).
> > > But the defaults assume 0.1 uF for the Mid filter, and enter it as 0.1
> > > rather than, say, 0.111 for phase (which would include those other
>
> > > capacitors). The difference is not meaningful enough to bother with, and
> > > gets confusing. But you can certainly add that extra capacitance to your
> > > measured capacitance if you want to be more precise.
>
> > >
> > > So "close" counts in horseshoes, hand-grenades and configuring the
> > > capacitor values.
> > >
> > >
> > > Sam W.

> > >
>
>
>
> > > --- In spectrumanalyzer@yahoogroups.com<spectrumanalyzer%40yahoogroups.com>,
>
> > > Jim Hontoria <jghalpha@> wrote:
> > > >
> > > > Sam,
> > > > 1. The Auto-wait checkbox is not available in this version. Also the
> > > > capacitor values that show on page 3 of the summary changes don't
>
> > > correspond
> > > > with the schematic.
> > > > 2. Question: are the video filter capacitor values which are entered in
> > > the
> > > > Hardware Configuration setup table actually used by the program? If that
>
> > > is
> > > > the case these should be measured values not just the nominals.
> > > >
> > > > Jim W1JGH
> > > >
> > > >
> > > >
> > > > On Sat, Jan 15, 2011 at 8:39 PM, Sam <swetterlin@> wrote:
>
> > > >
> > > > >
> > > > >
> > > > > I will have to leave that for Dave Roberts to resolve. I don't actually
> > > use
> > > > > USB at the moment and I have steered clear of the details of the USB
>
> > > > > interface. (I'm all in favor of USB, I just have plenty of other things
> > > to
> > > > > deal with.) Some of the initial DLL accesses occur before the
> > > configuration
>
> > > > > file is loaded, so maybe the problem is there.
> > > > > Sam W.
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com<spectrumanalyzer%40yahoogroups.com>
>
> > > <spectrumanalyzer%40yahoogroups.com>,
> > >
> > > > > Jim Hontoria <jghalpha@> wrote:
> > > > > >
> > > > > > Sam,
>

> > > > > > It appears that the software calls msadll.dll even when the USB
> > > interface
> > > > > is
> > > > > > not selected in the hardware setup. If running with the parallel
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> > > > > > interface with msadll.dll present in the directory AND the USB
> > > interface
> > > > > not
> > > > > > plugged in, this results in an error message. If msadll.dll is not
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> > > > > present
> > > > > > in the directory (or is renamed) then everything is OK. Not too
> > > serious
> > > > > > unless msadll is read regardless it is needed or not.
>
> > > > > >
> > > > > > BTW, are you running USB with the control; board or do you go
> > > directly to
> > > > > > the SLIMs ? I tried to go to the SLIMs directly and couldn't get it
>
> > > to
> > > > > > work, I am going back temporarily to parallel; I may have messed the
> > > > > > hardware..
> > > > > >
> > > > > > Jim W1JGH
> > > > > >
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> > > > > > On Mon, Jan 10, 2011 at 4:03 PM, Sam <swetterlin@> wrote:
> > > > > >
> > > > > > >
> > > > > > >
> > > > > > > I posted a new version of the beta version 116 software in the
>
> > > Files
> > > > > > > section at:
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> > > > > > > < >
> > > > > > >
> > > > >
> > > http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_version116_4d_Beta.zip
>
> > > > > > > >
> > > > > > >
> > > > > > > This fixes a couple of irritating bugs--one with saving files and
> > > one
> > > > > with
> > > > > > > the Filter Analysis function. It also contains a new test routine
>
> > > > > created by
> > > > > > > Scotty for scanning/tuning the cavity filter without having to

> > > tinker
> > > > > with
> > > > > > > cables, which isn't documented yet but will be when any kinks are
>
> > > > > ironed
> > > > > > > out.
> > > > > > >
> > > > > > > Sam W.
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> > > > > > Jim G. Hontoria
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> > > > Jim G. Hontoria
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> > Jim G. Hontoria
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> Jim G. Hontoria
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7470. Re: [spectrumanalyzer] Auto Wait

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-17 15:32:59 UTC
From: Robert Fish
Topic: 7013 Message: 7470

Seems like Yahoo has been having its problems lately. One morning last week, I sent a message that didn't get posted. So I sent a second message. Later that afternoon only the second message got posted.

Bob

> Jim
> At this moment, Yahoo seems to be in la-la land. My prior message has
> not yet been posted and it won't let me "reply" to messages. But I
> assume that message and this will ultimately get through.
>
> Regarding the fact that the auto wait box still appears with your
> sparse P2 and P3 calibrations. If auto wait is already selected when a
> new path is loaded, the disabling of auto wait for sparse calibrations
> doesn't work. I have now fixed that.
>
> Sam W.
>
>

7471. Problems with parallel interface

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-19 20:06:21 UTC
From: Jurgen
Topic: 7467 Message: 7471

I am trying to test the A/D converters by connecting them to the
parallel interface using the PC display.
The software is installed and working as far as I can make out.
Four interface connections to the A/D converters are made.

I have data signals on U3 pins D3 to D7 but no Auto LE signal on pin 11
of U3 or pin 14 of the LPT connector.
Any suggestions on how to fix this.

Jurgen

7472. Re: [spectrumanalyzer] Problems with parallel interface

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-20 04:24:09 UTC
From: william sprowls
Topic: 7467 Message: 7472

Hi Jurgen,
 Remove your parallel port cable from the computer and test those signals directly on the computer. If there, the cable would be suspect.
Scotty

--- On Wed, 1/19/11, Jurgen <khj221@...> wrote:

From: Jurgen <khj221@...>
Subject: [spectrumanalyzer] Problems with parallel interface
To: spectrumanalyzer@yahoogroups.com
Date: Wednesday, January 19, 2011, 2:06 PM

I am trying to test the A/D converters by connecting them to the

parallel interface using the PC display.

The software is installed and working as far as I can make out.

Four interface connections to the A/D converters are made.

I have data signals on U3 pins D3 to D7 but no Auto LE signal on pin 11

of U3 or pin 14 of the LPT connector.

Any suggestions on how to fix this.

Jurgen

7473. Resolution filters (Final Crystal Filters)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-20 05:18:29 UTC
From: wayne.salzwedel
Topic: 7473 Message: 7473

OK, I need some help! I am not sure what to use for my first Resolution filter? I understand that once I have my MSA up and running that I will be able to test filters and build some good ones for the rest of the BW steps, but what about the first one?

I have spent 3-4 days now looking for parts and I have some ideas, but no clear direction on which way to go. I don't have much for test equipment either. Does anyone have a design that will work that I can get all the parts for? I do have one of the PWB-MCF rev A boards, but have not found anything to put on it.

I am more than willing to pay for what I need, but just need some direction.

Thanks All !!

Wayne

7474. Re: Resolution filters (Final Crystal Filters)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-20 15:27:43 UTC
From: Sam
Topic: 7473 Message: 7474

If you just want a filter that can let you determine whether everything else is basically functional, you can build a 60 kHz bandwidth filter very simply, by cascading two ceramic filters and adding impedance matching components. The results are shown here:

<http://groups.yahoo.com/group/spectrumanalyzer/photos/album/271352628/pic/471013266/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>

That image used resistors to match, but you would want to use 1.8 uH inductors (Q of at least 20) leading to the filters and 100 pF shunt to ground at the filter terminals. You likely could get by without any fine tuning, though you would probably want to tune it later.

The wide filter limits the resolution of your scans, but there is very little chance that its shape will come out totally wacko, so it at least lets you see whether the rest of the MSA works. And when you have a full set of RBW filters, this can be one of them.

For narrower filters, a simple way to get started is to buy a canned filter on eBay, such as this one:

<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=150546045545&ssPageName=STRK:MEWAX:IT>

eBay filters don't always specify the terminating impedance, but this one does. The termination is specified as 2000 ohms,which you would match to 50 ohms with 4.7 uH inductors leading to the filter terminals and 47 pF capacitance shunt to ground from the terminals. To allow some tuning, use 33 pF capacitors and a small trimmer that goes to 25 pF or so. You don't need any equipment to tune it other than the MSA. Just install it as the RBW filter, and do a sweep with center=0 and span=0.02 MHz and you should get a nice graph of the top 50 dB or so of its response, which is all you need for tuning. Adjust the trimmers until the top of the response looks good.

For a PCB, you can use a blank double-sided board. Drill holes for the terminals and for a few ground vias. Mount the filter on the bottom and solder its case to ground. Put the components on the top with a fence running across the middle of the filter to isolate the input and output. Solder a fence around the outside of the board and solder a lid on it to cover the components. (If the fence is soldered to both the top and bottom ground planes, you can skip the ground vias described above.) It is not critical to solder the lid to the isolation fence in the middle of the filter. Poke/drill/cut two holes in the lid so you can tune the trimmers. You can cover the holes later with copper tape (or tack on a piece of brass), though it doesn't seem to cause any harm to leave them open.

I forgot the SMA connectors. Poke holes in the enclosing fence and solder the connectors to the fence with the center pin poking through the hole. A filter built with a similar approach is shown here:

<http://groups.yahoo.com/group/spectrumanalyzer/photos/album/271352628/pic/664919547/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "wayne.salzwedel" <wayne.salzwedel@...> wrote:
>
> OK, I need some help! I am not sure what to use for my first Resolution filter? I understand that once I have my MSA up and running that I will be able to test filters and build some good ones for the rest of the BW steps, but what about the first one?
>
> I have spent 3-4 days now looking for parts and I have some ideas, but no clear direction on which way to go. I don't have much for test equipment either. Does anyone have a design that will work that I can get all the parts for? I do have one of the PWB-MCF rev A boards, but have not found anything to put on it.
>
> I am more than willing to pay for what I need, but just need some direction.
>
> Thanks All !!
>
> Wayne
>

7475. Re: [spectrumanalyzer] Problems with parallel interface

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-20 16:27:19 UTC
From: Jurgen
Topic: 7467 Message: 7475

I mounted a male DB25 connector on the interface board. That seems to
incorrect, pin 14 is grounded.
Looks like it needs a female connector.

CONFUSED, how did I get there?

Can you please confirm.
There is a signal on Pin 14 but it gets shorted.

Jurgen

On 1/19/2011 11:24 PM, william sprowls wrote:
>
> Hi Jurgen,
> Remove your parallel port cable from the computer and test those
> signals directly on the computer. If there, the cable would be suspect.
> Scotty
>
> --- On *Wed, 1/19/11, Jurgen /<khj221@...>/* wrote:
>
>
> From: Jurgen <khj221@...>
> Subject: [spectrumanalyzer] Problems with parallel interface
> To: spectrumanalyzer@yahoogroups.com
> Date: Wednesday, January 19, 2011, 2:06 PM
>
> I am trying to test the A/D converters by connecting them to the
> parallel interface using the PC display.
> The software is installed and working as far as I can make out.
> Four interface connections to the A/D converters are made.
>
> I have data signals on U3 pins D3 to D7 but no Auto LE signal on
> pin 11
> of U3 or pin 14 of the LPT connector.
> Any suggestions on how to fix this.
>
> Jurgen
>
>
>

7476. Re: [spectrumanalyzer] Problems with parallel interface

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-21 04:16:02 UTC
From: william sprowls
Topic: 7467 Message: 7476

The DB25 connector on the control board must be female.
Scotty

--- On Thu, 1/20/11, Jurgen <khj221@...> wrote:

From: Jurgen <khj221@bellsouth.net>
Subject: Re: [spectrumanalyzer] Problems with parallel interface
To: spectrumanalyzer@yahoogroups.com
Date: Thursday, January 20, 2011, 10:27 AM

I mounted a male DB25 connector on the interface board. That seems
to incorrect, pin 14 is grounded.

Looks like it needs a female connector.

CONFUSED, how did I get there?

Can you please confirm.

There is a signal on Pin 14 but it gets shorted.

Jurgen

On 1/19/2011 11:24 PM, william sprowls wrote:

Hi Jurgen,

 Remove your parallel port cable from the computer
and test those signals directly on the computer.
If there, the cable would be suspect.

Scotty

--- On Wed, 1/19/11, Jurgen <khj221@bellsouth.net>
wrote:

From: Jurgen <khj221@...>

Subject: [spectrumanalyzer] Problems with
parallel interface

To: spectrumanalyzer@yahoogroups.com

Date: Wednesday, January 19, 2011, 2:06 PM

I am trying to test the A/D converters by
connecting them to the

parallel interface using the PC display.

The software is installed and working as
far as I can make out.

Four interface connections to the A/D
converters are made.

I have data signals on U3 pins D3 to D7
but no Auto LE signal on pin 11

of U3 or pin 14 of the LPT connector.

Any suggestions on how to fix this.

Jurgen

7477. Re: [spectrumanalyzer] Problems with parallel interface

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-21 16:41:15 UTC
From: Jurgen
Topic: 7467 Message: 7477

Thanks Scotty, changed the connector signals are present now.
I connected both Mag and Phase A/D inputs in parallel for testing.
SDO of the phase AD looks fine, the graph moves up/down following the
input voltage. The Mag AD only generates a single bit, it does not
change with a changing input voltage, the line on the graph is stuck at
0 dBm. Looks like a damaged AD.
Jurgen

On 1/20/2011 11:16 PM, william sprowls wrote:
>
> The DB25 connector on the control board must be female.
> Scotty
>
> --- On *Thu, 1/20/11, Jurgen /<khj221@...>/* wrote:
>
>
> From: Jurgen <khj221@...>
> Subject: Re: [spectrumanalyzer] Problems with parallel interface
> To: spectrumanalyzer@yahoogroups.com
> Date: Thursday, January 20, 2011, 10:27 AM
>
> I mounted a male DB25 connector on the interface board. That seems
> to incorrect, pin 14 is grounded.
> Looks like it needs a female connector.
>
> CONFUSED, how did I get there?
>
> Can you please confirm.
> There is a signal on Pin 14 but it gets shorted.
>
> Jurgen
>
>
>
>
> On 1/19/2011 11:24 PM, william sprowls wrote:
>
>> Hi Jurgen,
>> Remove your parallel port cable from the computer and test those
>> signals directly on the computer. If there, the cable would be
>> suspect.
>> Scotty
>>
>> --- On *Wed, 1/19/11, Jurgen /<khj221@...>
>> </mc/compose?to=khj221@...>/* wrote:

```
>>
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>> From: Jurgen <khj221@...>
>> </mc/compose?to=khj221@...>
>> Subject: [spectrumanalyzer] Problems with parallel interface
>> To: spectrumanalyzer@yahoogroups.com
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>> Any suggestions on how to fix this.
>>
>> Jurgen
>>
>>
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```

7478. Re: [spectrumanalyzer] Problems with parallel interface

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-21 20:20:26 UTC
From: Jim Hontoria
Topic: 7467 Message: 7478

Jurgen,
I had lots of trouble with that chip because of its size. At the end it was
a solder problem. I have found that if I don't clean the board thoroughly
prior to soldering problems will pop up. Now, even with a thorough clean up
I first deposit solder on the lands/ pads, remove excess solder with a wick
and then I solder the chips.

Jim
On Fri, Jan 21, 2011 at 11:41 AM, Jurgen <khj221@...> wrote:

>
>
> Thanks Scotty, changed the connector signals are present now.
> I connected both Mag and Phase A/D inputs in parallel for testing.
> SDO of the phase AD looks fine, the graph moves up/down following the input
> voltage. The Mag AD only generates a single bit, it does not change with a
> changing input voltage, the line on the graph is stuck at 0 dBm. Looks like
> a damaged AD.
> Jurgen
>
>
>
>
>
>
> On 1/20/2011 11:16 PM, william sprowls wrote:
>
>
>
> The DB25 connector on the control board must be female.
> Scotty
>
> --- On *Thu, 1/20/11, Jurgen <khj221@...> <khj221@...>
> * wrote:
>
>
> From: Jurgen <khj221@...> <khj221@...>
> Subject: Re: [spectrumanalyzer] Problems with parallel interface
> To: spectrumanalyzer@yahoogroups.com
> Date: Thursday, January 20, 2011, 10:27 AM
>
>
>
> I mounted a male DB25 connector on the interface board. That seems to
> incorrect, pin 14 is grounded.

> Looks like it needs a female connector.
>
> CONFUSED, how did I get there?
>
> Can you please confirm.
> There is a signal on Pin 14 but it gets shorted.
>
> Jurgen
>
>
>
>
> On 1/19/2011 11:24 PM, william sprowls wrote:
>
>
>
> Hi Jurgen,
> Remove your parallel port cable from the computer and test those signals
> directly on the computer. If there, the cable would be suspect.
> Scotty
>
> --- On *Wed, 1/19/11, Jurgen <khj221@bellsouth.net><http://mc/compose?to=khj221@...>
> * wrote:
>
>
> From: Jurgen <khj221@...><http://mc/compose?to=khj221@bellsouth.net>
> Subject: [spectrumanalyzer] Problems with parallel interface
> To:
spectrumanalyzer@yahoogroups.com<http://mc/compose?to=spectrumanalyzer@yahoogroups.com>
> Date: Wednesday, January 19, 2011, 2:06 PM
>
>
>
> I am trying to test the A/D converters by connecting them to the
> parallel interface using the PC display.
> The software is installed and working as far as I can make out.
> Four interface connections to the A/D converters are made.
>
> I have data signals on U3 pins D3 to D7 but no Auto LE signal on pin 11
> of U3 or pin 14 of the LPT connector.
> Any suggestions on how to fix this.
>
> Jurgen
>
>
>
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>

--
Jim G. Hontoria

7479. Re: [spectrumanalyzer] Problems with parallel interface

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-21 22:07:58 UTC
From: william sprowls
Topic: 7467 Message: 7479

Hi Jurgen,
It does sound like the Mag AtoD input pin is shorted to 5 volts. This has happened before.
If so, remove the short. It would not harm the ic.
Read the "Hard Failure" procedure on the web page:
http://scottyspectrumanalyzer.com/trouble.html
Scotty

--- On Fri, 1/21/11, Jurgen <khj221@bellsouth.net> wrote:

From: Jurgen <khj221@...>
Subject: Re: [spectrumanalyzer] Problems with parallel interface
To: spectrumanalyzer@yahoogroups.com
Date: Friday, January 21, 2011, 10:41 AM

Thanks Scotty, changed the connector signals are present now.

I connected both Mag and Phase A/D inputs in parallel for testing.

SDO of the phase AD looks fine, the graph moves up/down following
the input voltage. The Mag AD only generates a single bit, it does
not change with a changing input voltage, the line on the graph is
stuck at 0 dBm. Looks like a damaged AD.

Jurgen

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The DB25
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Scotty

--- On Thu, 1/20/11, Jurgen <khj221@...>
wrote:

From: Jurgen <khj221@...>

Subject: Re: [spectrumanalyzer] Problems with
parallel interface

To: spectrumanalyzer@yahoogroups.com

Date: Thursday, January 20, 2011, 10:27 AM

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interface board. That seems to incorrect,
pin 14 is grounded.

Looks like it needs a female connector.

CONFUSED, how did I get there?

Can you please confirm.

There is a signal on Pin 14 but it gets
shorted.

Jurgen

On 1/19/2011 11:24 PM, william sprowls
wrote:

Hi Jurgen,

 Remove your parallel port
cable from the computer and
test those signals directly on
the computer. If there, the
cable would be suspect.

Scotty

--- On Wed, 1/19/11,
Jurgen <khj221@...>
wrote:

From: Jurgen <khj221@...>

Subject: [spectrumanalyzer]
Problems with parallel
interface

To: spectrumanalyzer@yahoogroups.com

Date: Wednesday, January 19,
2011, 2:06 PM

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the A/D converters by
connecting them to the

parallel interface
using the PC display.

The software is
installed and working
as far as I can make
out.

Four interface
connections to the A/D
converters are made.

I have data signals on
U3 pins D3 to D7 but

no Auto LE signal on
pin 11

of U3 or pin 14 of the
LPT connector.

Any suggestions on how
to fix this.

Jurgen

7480. Re: [spectrumanalyzer] Problems with parallel interface

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-21 23:30:34 UTC
From: Jurgen
Topic: 7467 Message: 7480

Hello Scotty,
Unfortunately the input pin is not shorted to VCC, it follows the
applied voltage.
I wonder if I damaged the chip by using the wrong DB25 connector.
Jurgen

On 1/21/2011 5:07 PM, william sprowls wrote:
>
> Hi Jurgen,
> It does sound like the Mag AtoD input pin is shorted to 5 volts. This
> has happened before. If so, remove the short. It would not harm the ic.
> Read the "Hard Failure" procedure on the web page:
> http://scottyspectrumanalyzer.com/trouble.html
> Scotty
>
> --- On *Fri, 1/21/11, Jurgen /<khj221@...>/* wrote:
>
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> From: Jurgen <khj221@...>
> Subject: Re: [spectrumanalyzer] Problems with parallel interface
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>>
>>
>> From: Jurgen <khj221@...>

>> </mc/compose?to=khj221@...>
>> Subject: Re: [spectrumanalyzer] Problems with parallel interface
>> To: spectrumanalyzer@yahoogroups.com
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>>> them to the
>>> parallel interface using the PC display.
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>>> I have data signals on U3 pins D3 to D7 but no Auto LE
>>> signal on pin 11
>>> of U3 or pin 14 of the LPT connector.
>>> Any suggestions on how to fix this.
>>>
>>> Jurgen
>>>

>>>
>>
>
>

7481. Relay Switching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-22 00:46:13 UTC
From: Sam
Topic: 7481 Message: 7481

After building some switches with latched Tyco relays, I have explored some other possibilities. These relays have roughly 100 dB isolation at low frequencies (<50 MHz or so), so a single relay can be useful for some purposes. The 12 V non-latching version actually only needs 9V, and uses only about 10 mA. So I decided to try it.

Several places sell the 12V non-latching version, but all have it on backorder. Farnell and RS-Online have only about 1 week delays, but when I tried ordering the relay, neither would allow me to enter a non-UK address. Apparently they don't sell outside the UK. Does anyone know anything about those outfits?

I did place an order at Future Electronics, which is also on backorder, but they don't give me an estimated availability date. We'll see how that goes.

Assuming I can buy these things, here is my plan. I want to build a test set that includes a bridge, a buffer amp and a transmission/reflection switch. I'm aiming at relatively low frequencies on this one, both to simplify the switching and to have a frequency range where high accuracy can be achieved with minimal calibration. The DUT input would be connected to the Active Bridge, and the DUT output would be connected to the buffer amp. Up to 100 MHz, the DUT would see extremely good 50-ohm source and load impedances, and the bridge would perform very well with reference calibration. (I.e., just establish the base signal level with an Open calibration, without needing full OSL). The MSA could switch between Transmission and Reflection without cable changes and without distorting the measurements.

This board would actually be quite usable for measuring transmission and reflection with a spectrum analyzer+tracking generator, without VNA features, up to 100 MHz.

Above 100 MHz, performance would gradually deteriorate but could be corrected by more full calibration, with an ultimate limit of 300 MHz or so.

The switching would be done with a single relay. If the bridge reflection output is, say, -25 dBm (for 0 dB return loss) to -65 dBm (for 40 dB return loss), and the transmission signal is -5 dBm to -105 dBm, and the relay isolation is 95 dB, here is the situation regarding the transmission and reflection signals interfering with each other. A strong -5 dBm transmission signal could add -105 dBm contamination to the weakest (-65 dBm) reflection signal. That creates minimal error. A strong -25 dBm reflection signal could add -120 dBm contamination to the weakest (-105 dBm) transmission signal. That might affect the transmission reading by 1 or 2 dB, but that sort of error in a tiny transmission value would rarely mean much.

Sam W.

7482. Re: [spectrumanalyzer] Relay Switching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-22 01:44:55 UTC
From: Jim Hontoria
Topic: 7481 Message: 7482

I bought from Farnell on March 2010 some BCD switches for my GPS frequency reference.. The services was quick and efficient and the prices of UK components are very good. Their email: export@..., Phone 44 870 120 0208. Their web site (where I placed my order) www.farnell.co.uk.

Jim W1JGH

On Fri, Jan 21, 2011 at 7:46 PM, Sam <swetterlin@...> wrote:

>
>
> After building some switches with latched Tyco relays, I have explored some
> other possibilities. These relays have roughly 100 dB isolation at low
> frequencies (<50 MHz or so), so a single relay can be useful for some
> purposes. The 12 V non-latching version actually only needs 9V, and uses
> only about 10 mA. So I decided to try it.
>
> Several places sell the 12V non-latching version, but all have it on
> backorder. Farnell and RS-Online have only about 1 week delays, but when I
> tried ordering the relay, neither would allow me to enter a non-UK address.
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> those outfits?
>
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> set that includes a bridge, a buffer amp and a transmission/reflection
> switch. I'm aiming at relatively low frequencies on this one, both to
> simplify the switching and to have a frequency range where high accuracy can
> be achieved with minimal calibration. The DUT input would be connected to
> the Active Bridge, and the DUT output would be connected to the buffer amp.
> Up to 100 MHz, the DUT would see extremely good 50-ohm source and load
> impedances, and the bridge would perform very well with reference
> calibration. (I.e., just establish the base signal level with an Open
> calibration, without needing full OSL). The MSA could switch between
> Transmission and Reflection without cable changes and without distorting the
> measurements.
>
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> reflection with a spectrum analyzer+tracking generator, without VNA
> features, up to 100 MHz.
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> Above 100 MHz, performance would gradually deteriorate but could be
> corrected by more full calibration, with an ultimate limit of 300 MHz or so.
>

> The switching would be done with a single relay. If the bridge reflection
> output is, say, -25 dBm (for 0 dB return loss) to -65 dBm (for 40 dB return
> loss), and the transmission signal is -5 dBm to -105 dBm, and the relay
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> add -120 dBm contamination to the weakest (-105 dBm) transmission signal.
> That might affect the transmission reading by 1 or 2 dB, but that sort of
> error in a tiny transmission value would rarely mean much.
>
> Sam W.
>
>
>

--
Jim G. Hontoria

7483. Re: [spectrumanalyzer] Relay Switching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-22 01:46:44 UTC
From: Jim Hontoria
Topic: 7481 Message: 7483

Correction: email is export@...

Jim

On Fri, Jan 21, 2011 at 8:44 PM, Jim Hontoria <jghalpha@...> wrote:

> I bought from Farnell on March 2010 some BCD switches for my GPS frequency
> reference.. The services was quick and efficient and the prices of UK
> components are very good. Their email: export@..., Phone 44 870
> 120 0208. Their web site (where I placed my order) www.farnell.co.uk.
>
> Jim W1JGH
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>
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>> After building some switches with latched Tyco relays, I have explored
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>> purposes. The 12 V non-latching version actually only needs 9V, and uses
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>> those outfits?
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>> but they don't give me an estimated availability date. We'll see how that
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>> Assuming I can buy these things, here is my plan. I want to build a test
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>> simplify the switching and to have a frequency range where high accuracy can
>> be achieved with minimal calibration. The DUT input would be connected to
>> the Active Bridge, and the DUT output would be connected to the buffer amp.
>> Up to 100 MHz, the DUT would see extremely good 50-ohm source and load
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>> calibration. (I.e., just establish the base signal level with an Open
>> calibration, without needing full OSL). The MSA could switch between
>> Transmission and Reflection without cable changes and without distorting the
>> measurements.
>>

>> This board would actually be quite usable for measuring transmission and
>> reflection with a spectrum analyzer+tracking generator, without VNA
>> features, up to 100 MHz.
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>> Above 100 MHz, performance would gradually deteriorate but could be
>> corrected by more full calibration, with an ultimate limit of 300 MHz or so.
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>> The switching would be done with a single relay. If the bridge reflection
>> output is, say, -25 dBm (for 0 dB return loss) to -65 dBm (for 40 dB return
>> loss), and the transmission signal is -5 dBm to -105 dBm, and the relay
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>> reflection signals interfering with each other. A strong -5 dBm transmission
>> signal could add -105 dBm contamination to the weakest (-65 dBm) reflection
>> signal. That creates minimal error. A strong -25 dBm reflection signal could
>> add -120 dBm contamination to the weakest (-105 dBm) transmission signal.
>> That might affect the transmission reading by 1 or 2 dB, but that sort of
>> error in a tiny transmission value would rarely mean much.
>>
>> Sam W.
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>
> --
> Jim G. Hontoria
>

--
Jim G. Hontoria

7484. Re: [spectrumanalyzer] Problems with parallel interface

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-22 05:00:14 UTC
From: william sprowls
Topic: 7467 Message: 7484

Hi Jurgen,
 I doubt you could have done any damage with a reversed connector. The worse you could do is apply a computer's output signal (high level) to the outputs of the MUN2211 buffer transistors in the AtoD module. You could look at that area, base and collector for signals with a 'scope. Also, make certain you have "pull up" resistors in either your computer, or on the Control Board.
Scotty

--- On Fri, 1/21/11, Jurgen <khj221@bellsouth.net> wrote:

From: Jurgen <khj221@...>
Subject: Re: [spectrumanalyzer] Problems with parallel interface
To: spectrumanalyzer@...m
Date: Friday, January 21, 2011, 5:30 PM

Hello Scotty,

Unfortunately the input pin is not shorted to VCC, it follows the applied voltage.

I wonder if I damaged the chip by using the wrong DB25 connector.

Jurgen

On 1/21/2011 5:07 PM, william sprowls wrote:

Hi Jurgen,

It does sound like the Mag AtoD input pin is shorted to 5 volts. This has happened before. If so, remove the short. It would not harm the ic.

Read the "Hard Failure" procedure on the web page:

http://scottyspectrumanalyzer.com/trouble.html

Scotty

--- On Fri, 1/21/11, Jurgen <khj221@...>
wrote:

From: Jurgen <khj221@...>

Subject: Re: [spectrumanalyzer] Problems with parallel interface

To: spectrumanalyzer@yahoogroups.com

Date: Friday, January 21, 2011, 10:41 AM

Thanks Scotty, changed the connector signals are present now.

I connected both Mag and Phase A/D inputs in parallel for testing.

SDO of the phase AD looks fine, the graph moves up/down following the input voltage. The Mag AD only generates a single bit, it does not change with a changing input voltage, the line on the graph is stuck at 0 dBm. Looks like a damaged AD.

Jurgen

On 1/20/2011 11:16 PM, william sprowls wrote:

The DB25 connector on the control board must be female.

Scotty

--- On Thu, 1/20/11, Jurgen <khj221@...> wrote:

From: Jurgen <khj221@...>

Subject: Re: [spectrumanalyzer] Problems with parallel interface

To: spectrumanalyzer@yahoogroups.com

Date: Thursday, January 20, 2011, 10:27 AM

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Looks like it needs a female connector.

CONFUSED, how did I get there?

Can you please confirm.

There is a signal on
Pin 14 but it gets
shorted.

Jurgen

On 1/19/2011 11:24 PM,
william sprowls wrote:

Hi
Jurgen,

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parallel port
cable from the
computer and
test those
signals
directly on
the computer.
If there, the
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Scotty

--- On Wed,
1/19/11,
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Problems with
parallel
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pins D3 to D7
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signal on pin
11

of U3 or pin
14 of the LPT
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Any
suggestions on
how to fix
this.

Jurgen

7485. RE: [spectrumanalyzer] Relay Switching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-22 10:22:37 UTC
From: Neil Douglas
Topic: 7481 Message: 7485

Sam,

Farnell is Newark in the USA. Here in the UK we can order Newark components through Farnell - with some silly handling charge, I assume the same will apply in the reverse direction.

Regards

NeilD

G4SHJ

From: spectrumanalyzer@yahoogroups.com
[mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of Sam
Sent: 22 January 2011 00:46
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Relay Switching

After building some switches with latched Tyco relays, I have explored some other possibilities. These relays have roughly 100 dB isolation at low frequencies (<50 MHz or so), so a single relay can be useful for some purposes. The 12 V non-latching version actually only needs 9V, and uses only about 10 mA. So I decided to try it.

Several places sell the 12V non-latching version, but all have it on backorder. Farnell and RS-Online have only about 1 week delays, but when I tried ordering the relay, neither would allow me to enter a non-UK address. Apparently they don't sell outside the UK. Does anyone know anything about those outfits?

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Sam W.

7486. Re: Relay Switching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-22 14:29:26 UTC
From: Sam
Topic: 7481 Message: 7486

I did find the relays at Newark, and saw that they would actually come from Farnell, but I didn't realize they were the same company. I did notice the handling charge--$20 on a $3 relay. So I kept looking. If the wait for them from Future Electronics is only a couple of weeks, that will be fine.

Omron now has a relay with comparable specs, but it is priced at $45. These HF3 relays are a steal.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Neil Douglas" <neil.douglas@...> wrote:
>
> Sam,
>
>
>
> Farnell is Newark in the USA. Here in the UK we can order Newark components
> through Farnell - with some silly handling charge, I assume the same will
> apply in the reverse direction.
>
>
>
> Regards
>
>
>
> NeilD
>
> G4SHJ
>
>
>
> _____
>
> From: spectrumanalyzer@yahoogroups.com
> [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of Sam
> Sent: 22 January 2011 00:46
> To: spectrumanalyzer@yahoogroups.com
> Subject: [spectrumanalyzer] Relay Switching
>
>
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> This board would actually be quite usable for measuring transmission and
> reflection with a spectrum analyzer+tracking generator, without VNA
> features, up to 100 MHz.
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> Above 100 MHz, performance would gradually deteriorate but could be
> corrected by more full calibration, with an ultimate limit of 300 MHz or so.
>
> The switching would be done with a single relay. If the bridge reflection
> output is, say, -25 dBm (for 0 dB return loss) to -65 dBm (for 40 dB return
> loss), and the transmission signal is -5 dBm to -105 dBm, and the relay
> isolation is 95 dB, here is the situation regarding the transmission and
> reflection signals interfering with each other. A strong -5 dBm transmission
> signal could add -105 dBm contamination to the weakest (-65 dBm) reflection
> signal. That creates minimal error. A strong -25 dBm reflection signal could
> add -120 dBm contamination to the weakest (-105 dBm) transmission signal.
> That might affect the transmission reading by 1 or 2 dB, but that sort of
> error in a tiny transmission value would rarely mean much.
>
> Sam W.
>

7487. Re: Relay Switching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-22 14:44:13 UTC
From: Greg Broburg
Topic: 7481 Message: 7487

Digi Key has them for under 5 bucks

Greg

On 1/22/2011 8:29 AM, Sam wrote:
>
> I did find the relays at Newark, and saw that they would actually come
> from Farnell, but I didn't realize they were the same company. I did
> notice the handling charge--$20 on a $3 relay. So I kept looking. If
> the wait for them from Future Electronics is only a couple of weeks,
> that will be fine.
>
> Omron now has a relay with comparable specs, but it is priced at $45.
> These HF3 relays are a steal.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Neil Douglas"
> <neil.douglas@...> wrote:
> >
> > Sam,
> >
> >
> >
> > Farnell is Newark in the USA. Here in the UK we can order Newark
> components
> > through Farnell - with some silly handling charge, I assume the same
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> >
> >
> >
> > Regards
> >
> >
> >
> > NeilD
> >
> > G4SHJ
> >
> >
> >
> > _____
> >

> > From: spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>
> > [mailto:spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>] On Behalf Of Sam
> > Sent: 22 January 2011 00:46
> > To: spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>
> > Subject: [spectrumanalyzer] Relay Switching
> >
> >
> >
> >
> >
> > After building some switches with latched Tyco relays, I have
> explored some
> > other possibilities. These relays have roughly 100 dB isolation at low
> > frequencies (<50 MHz or so), so a single relay can be useful for some
> > purposes. The 12 V non-latching version actually only needs 9V, and uses
> > only about 10 mA. So I decided to try it.
> >
> > Several places sell the 12V non-latching version, but all have it on
> > backorder. Farnell and RS-Online have only about 1 week delays, but
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> > tried ordering the relay, neither would allow me to enter a non-UK
> address.
> > Apparently they don't sell outside the UK. Does anyone know anything
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> > those outfits?
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> > I did place an order at Future Electronics, which is also on
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> > they don't give me an estimated availability date. We'll see how
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> > that includes a bridge, a buffer amp and a transmission/reflection
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> > I'm aiming at relatively low frequencies on this one, both to
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> > with minimal calibration. The DUT input would be connected to the Active
> > Bridge, and the DUT output would be connected to the buffer amp. Up
> to 100
> > MHz, the DUT would see extremely good 50-ohm source and load
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> > the bridge would perform very well with reference calibration.
> (I.e., just
> > establish the base signal level with an Open calibration, without

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> > full OSL). The MSA could switch between Transmission and Reflection
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> > Sam W.
> >
>
>

7488. Re: Relay Switching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-22 21:11:08 UTC
From: Sam
Topic: 7481 Message: 7488

Digi-Key has some 75 ohm relays and some non-12V 50 ohm relays, but no stock on 12V 50 ohms. That one is perfect for us because it can operate on 10V and takes so little current (10 mA) that if you are using just a few relays there is no need to bother with latching. The 5V relay uses 28 mA, which might also be acceptable but makes you think that maybe you should be doing latching.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Greg Broburg <semiflex@...> wrote:
>
> Digi Key has them for under 5 bucks
>
> Greg
>
>
> On 1/22/2011 8:29 AM, Sam wrote:
> >
> > I did find the relays at Newark, and saw that they would actually come
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> > Sam W.
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> > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "Neil Douglas"
> > <neil.douglas@> wrote:
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> > > Farnell is Newark in the USA. Here in the UK we can order Newark
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> > > NeilD
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> > > G4SHJ
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> > > _____
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> > > From: spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > [mailto:spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>] On Behalf Of Sam
> > > Sent: 22 January 2011 00:46
> > > To: spectrumanalyzer@...m
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > Subject: [spectrumanalyzer] Relay Switching
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> > > Apparently they don't sell outside the UK. Does anyone know anything
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> > > error in a tiny transmission value would rarely mean much.
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> > > Sam W.
> > >
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> >
>

7489. Re: Relay Switching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-23 17:49:37 UTC
From: allenkeehall
Topic: 7481 Message: 7489

Is this of any help? A bit over $4 in singles. Can't say about S&H.
http://www.onlinecomponents.com/amp-tyco_1462050-4.html?p=10222632

Best of Luck!

7490. Re: Relay Switching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-23 22:29:11 UTC
From: Sam
Topic: 7481 Message: 7490

Unfortunately, that one is a 75 ohm version, and they don't seem to have any 50 ohm relays.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "allenkeehall" <renais_sance@...> wrote:
>
>
>
> Is this of any help? A bit over $4 in singles. Can't say about S&H.
> http://www.onlinecomponents.com/amp-tyco_1462050-4.html?p=10222632
>
> Best of Luck!
>

7491. Re: Relay Switching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-24 00:40:53 UTC
From: Sam
Topic: 7481 Message: 7491

I should qualify my previous response. I am really big on having sources and loads have 50 ohm impedance in many situations. But what happens if you use a 75 ohm relay at 10.7 MHz? If the signal path within the relay is 1", the relay return loss is still better than 30 dB (measured re 50 ohms). That's normally pretty good. At 100 MHz, the return loss is 14 dB. For many purposes, that is inadequate. But in this case I am switching between reflection and transmission, and in both cases the DUT is separated from the relay by a buffer amplifier. The fact that the relay has return loss of 14 dB instead of infinite dB does not amount to a hill of beans, because the DUT cannot see the relay. Or, it sees it through a glass, darkly. So a 75 ohm relay is just fine.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Unfortunately, that one is a 75 ohm version, and they don't seem to have any 50 ohm relays.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "allenkeehall" <renais_sance@> wrote:
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> > Best of Luck!
> >
>

7492. ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-24 03:26:26 UTC
From: pzerkel
Topic: 7492 Message: 7492

I am seeing about 1.8v on U2 pin 3 (actually most measurements have been at J1). From the Test-as-you-build page it looks like I should only be seeing about 30 millivolts.

U3 pin 3 (J2) is similar but higher at about 2.7 volts.

I have ~4.96 volts at U2-1,2,7, and 8 and same at U3-1,2,7, and 8.

I am reasonably certain that there are no shorts between those pins and pin 3. If there was I'd expect to see 4.9 volts instead of ~2 volts.

I am not sure where else to look. At this point do I assume I did something to fry the AD7685's? OR is there something else to look for?

These tests have been with nothing connected to J1 or J2.

7493. Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-24 04:12:43 UTC
From: pzerkel
Topic: 7492 Message: 7493

Correction...the 4.96 volts is at U2-1,2, 9 & 10,,and same pins on U3.

>
> I have ~4.96 volts at U2-1,2,7, and 8 and same at U3-1,2,7, and 8.

7494. Re: [spectrumanalyzer] ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-24 04:38:01 UTC
From: william sprowls
Topic: 7492 Message: 7494

Use a different voltmeter (or scope) to test those two points. If the results are different, it would say that the different impedance of the voltmeter is creating a different load for those points. This would say that your "short" between pin 3 and pin 2 (or another pin connected to Vcc) is a "smudge" of leftover solder paste or other contaminate.
 This is not an uncommon occurrence when using solder paste or flux. Cleaning after soldering is of utmost importance.
Scotty

--- On Sun, 1/23/11, pzerkel <pzerkel@yahoo.com> wrote:

From: pzerkel <pzerkel@...>
Subject: [spectrumanalyzer] ADC trouble shooting
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, January 23, 2011, 9:26 PM

I am seeing about 1.8v on U2 pin 3 (actually most measurements have been at J1). From the Test-as-you-build page it looks like I should only be seeing about 30 millivolts.

U3 pin 3 (J2) is similar but higher at about 2.7 volts.

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I am not sure where else to look. At this point do I assume I did something to fry the AD7685's? OR is there something else to look for?

These tests have been with nothing connected to J1 or J2.

7495. Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-24 15:05:24 UTC
From: Sam
Topic: 7492 Message: 7495

The AD7685 has ESD diodes on its + input, one running to +5 and one running to ground. With nothing connected to the input connector, the voltage at the + input will be the result of voltage division of the two reverse-biased diodes. When you attach the voltmeter, of course, its impedance will reduce the voltage. If you have a very high impedance voltmeter, it would be possible to measure any voltage from 0 to 5, depending on the relative impedance of the diodes.

Measuring the voltage with the input connector open doesn't seem to mean much. It seems to me that the only thing that matters is that the voltage at the + input be very low--such as below 1 mV--when the input connector is attached to a resistance of something like 10k (I think that is the PDM output resistance).

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Use a different voltmeter (or scope) to test those two points. If the results are different, it would say that the different impedance of the voltmeter is creating a different load for those points. This would say that your "short" between pin 3 and pin 2 (or another pin connected to Vcc) is a "smudge" of leftover solder paste or other contaminate.
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> Scotty
>
> --- On Sun, 1/23/11, pzerkel <pzerkel@...> wrote:
>
> From: pzerkel <pzerkel@...>
> Subject: [spectrumanalyzer] ADC trouble shooting
> To: spectrumanalyzer@yahoogroups.com
> Date: Sunday, January 23, 2011, 9:26 PM
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7496. Re: [spectrumanalyzer] Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-24 17:23:16 UTC
From: william sprowls
Topic: 7492 Message: 7496

Hi Sam and All,
  It may not seem important that these AtoD inputs be extremely high impedance, but it is. This because we are not driving these inputs with low impedance source voltages. For example, the PDM source R is 10 K ohms.

 Here is the rationale:
Let's say the Phase AtoD had enough "filth" on the circuit board to create an impedance of 1 Meg ohm to +5volts. (If the input were measured with a voltmeter that had an impedance of 1 Meg ohm, the measurement would be +2.5 volts, referenced to ground.)
  Now, let' s say this Phase AtoD input were connected to the output of the PDM. The PDM is measuring 0 degrees. The PDM output should be 0 volts. Since the output has a 10 K ohm series resistor, this would create a "voltage divider" action between the PDM and the Phase AtoD input. That is, 10k to 0v and 1 Meg to +5v. The actual voltage on the input of the Phase AtoD is not 0 volts, it is +0.049505 volts, due to the voltage divider. The Phase AtoD would convert +0.049505 volts. The calculated phase would then become 360deg x .049505v/5.0v = 3.56 degrees. As you can see, this is a large error.
  If the PDM were measuring, say, 350 degrees, this error would be much smaller. This is because the source voltage is very high (+4.86 v) and would create a lower voltage drop across the 10 K ohm source resistance.
  Any error can be eliminated by guaranteeing extreme cleanliness of the AtoD inputs. This is the basis for the test on the web page,
http://scottyspectrumanalyzer.com/testingslim.html
Paragraph, "AtoD Module" is a good test. However, it assumes that the measuring voltmeter has an input impedance of somewhere between 1 Meg and 10 Meg ohms. This should be enough to "pull down" any voltage division created by the internal protection diodes.

This test would not normally be run if the MSA worked from the "get-go", but would be if there were an indication of a "strange" measurement. And pzerkel is definitely getting a strange measurement.
Scotty

--- On Mon, 1/24/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: ADC trouble shooting
To: spectrumanalyzer@yahoogroups.com
Date: Monday, January 24, 2011, 9:05 AM

The AD7685 has ESD diodes on its + input, one running to +5 and one running to ground. With nothing connected to the input connector, the voltage at the + input will be the result of voltage division of the two reverse-biased diodes. When you attach the voltmeter, of course, its impedance will reduce the voltage. If you have a very high impedance voltmeter, it would be possible to measure any voltage from 0 to 5, depending on the relative impedance of the diodes.

Measuring the voltage with the input connector open doesn't seem to mean much. It seems to me that the only thing that matters is that the voltage at the + input be very low--such as below 1 mV--when the input connector is attached to a resistance of something like 10k (I think that is the PDM output resistance).

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:

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> Use a different voltmeter (or scope) to test those two points. If the results are different, it would say that the different impedance of the voltmeter is creating a different load for those points. This would say that your "short" between pin 3 and pin 2 (or another pin connected to Vcc) is a "smudge" of leftover solder paste or other contaminate.

> Â This is not an uncommon occurrence when using solder paste or flux. Cleaning after soldering is of utmost importance.

> Scotty

>

> --- On Sun, 1/23/11, pzerkel <pzerkel@...> wrote:

>

> From: pzerkel <pzerkel@...>

> Subject: [spectrumanalyzer] ADC trouble shooting

> To: spectrumanalyzer@yahoogroups.com

> Date: Sunday, January 23, 2011, 9:26 PM

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> These tests have been with nothing connected to J1 or J2.

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7497. Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-24 18:23:12 UTC
From: Sam
Topic: 7492 Message: 7497

I don't doubt that we need the ADC to have high input impedance. But if someone happens to measure the DC voltage at the input with a very high quality voltmeter with high impedance, they may think they have a problem when they really don't.

In your example of 1 Meg leakage resistance, if the the input were loaded with 10k, then 50 mV would appear at the input, which, as you say, would be a problem. Without the 10K load, the reading would depend entirely on the voltmeter impedance. It just seems like a better test to me to place the 10k resistor and then measure. Or, if the voltmeter can't measure 1 mV, use a 100 k resistor.

If the reading of 2.7 volts is not with a very high impedance voltmeter, it certainly indicates a problem. I'm always paranoid about flux residue, so I put some flux on a PCB and measured its resistance. I used regular flux, not No-Clean, because the No-Clean supposedly is not very conductive. Try as I might, I could not get any resistance reading for the flux, on a meter that should register as high as 100 Meg. I even tried laying the probes parallel on the board as close together as I could get them. So that made me less paranoid, though there are so many different fluxes that you can't draw any grand conclusions from this experiment.

Of course, if you use the hot air method with solder paste, it is possible to have tiny solder balls remaining on the board between the pads. I found that if you heat the board a few extra seconds after it appears that everything is done, it seems to eliminate almost all of those. I clean the board with alcohol and a toothbrush (wiggling, not dragging, the brush), but I suppose it is always possible to have something left under the IC where you can't get at it.

I'm suspicious of the ESD diodes; they may have been damaged by ESD. There have been a number of reports about bad ICs, which I also suspect are ESD problems. In all my MSA modules, and all the various accessory items, I have yet to encounter a bad IC, so I think proper precautions could eliminate these problems. I don't do anything elaborate. I have a large anti-static mat on the workbench where I do all the assembly. It is grounded to an earth ground. I stand at the workbench because my theory is that a good share of static comes from clothing rubbing on a chair or even on the workbench, or shuffling your feet on the floor. I don't use a wrist-strap, but I frequently have one hand in contact with the anti-static mat. So maybe that works, or maybe I have been lucky.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Sam and All,
> Â It may not seem important that these AtoD inputs be extremely high impedance, but it is. This because we are not driving these inputs with low impedance source voltages. For example, the PDM source R is 10 K ohms.
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the input were measured with a voltmeter that had an impedance of 1 Meg ohm, the measurement would be +2.5 volts, referenced to ground.)
> Â Now, let' s say this Phase AtoD input were connected to the output of the PDM. The PDM is measuring 0 degrees. The PDM output should be 0 volts. Since the output has a 10 K ohm series resistor, this would create a "voltage divider" action between the PDM and the Phase AtoD input. That is, 10k to 0v and 1 Meg to +5v. The actual voltage on the input of the Phase AtoD is not 0 volts, it is +0.049505 volts, due to the voltage divider. The Phase AtoD would convert +0.049505 volts. The calculated phase would then become 360deg x .049505v/5.0v = 3.56 degrees. As you can see, this is a large error.
> Â If the PDM were measuring, say, 350 degrees, this error would be much smaller. This is because the source voltage is very high (+4.86 v) and would create a lower voltage drop across the 10 K ohm source resistance.
> Â Any error can be eliminated by guaranteeing extreme cleanliness of the AtoD inputs.
> This is the basis for the test on the web page,
> http://scottyspectrumanalyzer.com/testingslim.html
> Paragraph, "AtoD Module" is a good test. However, it assumes that the measuring voltmeter has an input impedance of somewhere between 1 Meg and 10 Meg ohms. This should be enough to "pull down" any voltage division created by the internal protection diodes.
>
> This test would not normally be run if the MSA worked from the "get-go", but would be if there were an indication of a "strange" measurement. And pzerkel is definitely getting a strange measurement.
> Scotty
>
> --- On Mon, 1/24/11, Sam <swetterlin@...> wrote:
>
> From: Sam <swetterlin@...>
> Subject: [spectrumanalyzer] Re: ADC trouble shooting
> To: spectrumanalyzer@yahoogroups.com
> Date: Monday, January 24, 2011, 9:05 AM
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> The AD7685 has ESD diodes on its + input, one running to +5 and one running to ground. With nothing connected to the input connector, the voltage at the + input will be the result of voltage division of the two reverse-biased diodes. When you attach the voltmeter, of course, its impedance will reduce the voltage. If you have a very high impedance voltmeter, it would be possible to measure any voltage from 0 to 5, depending on the relative impedance of the diodes.
>
>

>
> Measuring the voltage with the input connector open doesn't seem to mean much. It seems to me that the only thing that matters is that the voltage at the + input be very low--such as below 1 mV--when the input connector is attached to a resistance of something like 10k (I think that is the PDM output resistance).
>
>
>
> Sam W.
>
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>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
>
> >
>
> > Use a different voltmeter (or scope) to test those two points. If the results are different, it would say that the different impedance of the voltmeter is creating a different load for those points. This would say that your "short" between pin 3 and pin 2 (or another pin connected to Vcc) is a "smudge" of leftover solder paste or other contaminate.
>
> > ÃÂ This is not an uncommon occurrence when using solder paste or flux. Cleaning after soldering is of utmost importance.
>
> > Scotty
>
> >
>
> > --- On Sun, 1/23/11, pzerkel <pzerkel@> wrote:
>
> >
>
> > From: pzerkel <pzerkel@>
>
> > Subject: [spectrumanalyzer] ADC trouble shooting
>
> > To: spectrumanalyzer@yahoogroups.com
>
> > Date: Sunday, January 23, 2011, 9:26 PM
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> > I am seeing about 1.8v on U2 pin 3 (actually most measurements have been at J1). From the Test-as-you-build page it looks like I should only be seeing about 30 millivolts.
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>
> > U3 pin 3 (J2) is similar but higher at about 2.7 volts.
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>
> > I have ~4.96 volts at U2-1,2,7, and 8 and same at U3-1,2,7, and 8.
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>
> > I am reasonably certain that there are no shorts between those pins and pin 3. If there was I'd expect to see 4.9

volts instead of ~2 volts.
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> > I am not sure where else to look. At this point do I assume I did something to fry the AD7685's? OR is there something else to look for?
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>
> > These tests have been with nothing connected to J1 or J2.
>
> >
>

7498. Re: Relay Switching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-24 18:42:56 UTC
From: allenkeehall
Topic: 7481 Message: 7498

Well, that's what I was thinking Sam. But I respect the concepts of looking through clear glass and bountiful hills of beans.

Mouser has some availability of the Omron 50 Ohm relays. Search on G6Z-1F-A-DC12. They're a bit more but under $6. http://www.mouser.com

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I should qualify my previous response. I am really big on having sources and loads have 50 ohm impedance in many situations. But what happens if you use a 75 ohm relay at 10.7 MHz? If the signal path within the relay is 1", the relay return loss is still better than 30 dB (measured re 50 ohms). That's normally pretty good. At 100 MHz, the return loss is 14 dB. For many purposes, that is inadequate. But in this case I am switching between reflection and transmission, and in both cases the DUT is separated from the relay by a buffer amplifier. The fact that the relay has return loss of 14 dB instead of infinite dB does not amount to a hill of beans, because the DUT cannot see the relay. Or, it sees it through a glass, darkly. So a 75 ohm relay is just fine.
>
> Sam W.

7499. Re: Relay Switching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-24 19:51:10 UTC
From: Sam
Topic: 7481 Message: 7499

The Omron's are decent relays, but their isolation is about 15 dB worse than the Tyco's. When you combine 3 SPDT relays to form a high-isolation SPDT, this difference doesn't matter because the final isolation will be excellent either way. But I'm trying to squeak by with a single relay, and that extra 15 dB will be a big help.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "allenkeehall" <renais_sance@...> wrote:
>
> Well, that's what I was thinking Sam. But I respect the concepts of looking through clear glass and bountiful hills of beans.
>
> Mouser has some availability of the Omron 50 Ohm relays. Search on G6Z-1F-A-DC12. They're a bit more but under $6. http://www.mouser.com
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > I should qualify my previous response. I am really big on having sources and loads have 50 ohm impedance in many situations. But what happens if you use a 75 ohm relay at 10.7 MHz? If the signal path within the relay is 1", the relay return loss is still better than 30 dB (measured re 50 ohms). That's normally pretty good. At 100 MHz, the return loss is 14 dB. For many purposes, that is inadequate. But in this case I am switching between reflection and transmission, and in both cases the DUT is separated from the relay by a buffer amplifier. The fact that the relay has return loss of 14 dB instead of infinite dB does not amount to a hill of beans, because the DUT cannot see the relay. Or, it sees it through a glass, darkly. So a 75 ohm relay is just fine.
> >
> > Sam W.
>

7500. Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-24 20:17:49 UTC
From: pzerkel
Topic: 7492 Message: 7500

Just a couple comments that may be relevant.

The DMM I am using is a Fluke 179. According tot he specifications page, the DC volt input impedance is > 10 M ohms < 100 pf"

I have two ADC's. I will report more details on differences when I can measure more.

As for ESD...I will just say I suspect that could be my problem. I probably should be taking better precautions.

I will work on it some more this evening and report back results.

-Paul

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I don't doubt that we need the ADC to have high input impedance. But if someone happens to measure the DC voltage at the input with a very high quality voltmeter with high impedance, they may think they have a problem when they really don't.
>
>

7501. Crystal Ladder Filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-24 23:10:49 UTC
From: Sam
Topic: 7501 Message: 7501

I have not actually built a crystal ladder filter, but I have tested some crystals and used the results to simulate some filters. I'm looking at bandwidth in the 500-1000 Hz range. Before I started playing with the simulations, I assumed that getting a good response with a narrow bandwidth might require more crystals than for a wider bandwidth. Exactly the opposite seems to be the case, as the simulation results are very good for a 800 Hz filter with 4 crystals and a 500 Hz filter with 3 crystals. This is good news, as the smaller number of crystals obviously simplifies crystal matching and tuning of the assembled circuit.

Another interesting simulation experiment: I used 5 crystals and did away with all the series and shunt capacitors and put unity gain buffer amps between the stages. Four amps total--no amp at input and output. I made the source and load 50 ohms. Then I put a 100 ohm load at the output of each crystal. I got a very nice response with a bandwidth something like 900 Hz, and ultimate attenuation of at least 110 dB. I reduced all the crystal loads to 50 ohms, and the bandwidth narrowed to about 500 Hz. This general idea was discussed long ago, based on an HP design that varied the loads with PIN diodes in order to change the bandwidth. But it also is a nice simple design to get a narrow bandwidth which you can adjust during assembly to get your target bandwidth. For real-world crystals, the frequencies of the crystals can be adjusted to identical values with series capacitors, and there is no reason that the final response should have any ripple whatsoever.

It appears that the 500 Hz buffered filter could be done with 4 crystals and still get good response. This would require only 3 amps, which could be tiny inexpensive op amps, in order to achieve good power supply rejection. One stage could have gain to eliminate the filter loss.

Sam W.

7502. Re: [spectrumanalyzer] Crystal Ladder Filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-25 04:57:31 UTC
From: william sprowls
Topic: 7501 Message: 7502

Hi Sam,
As a side note, if planning to add gain within a filter, you could actually eliminate the need for the I.F. Amplifier in the MSA. Just make the total gain of the "Amplifilter" about 35 dB.
Scotty

--- On Mon, 1/24/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Crystal Ladder Filters
To: spectrumanalyzer@yahoogroups.com
Date: Monday, January 24, 2011, 5:10 PM

I have not actually built a crystal ladder filter, but I have tested some crystals and used the results to simulate some filters. I'm looking at bandwidth in the 500-1000 Hz range. Before I started playing with the simulations, I assumed that getting a good response with a narrow bandwidth might require more crystals than for a wider bandwidth. Exactly the opposite seems to be the case, as the simulation results are very good for a 800 Hz filter with 4 crystals and a 500 Hz filter with 3 crystals. This is good news, as the smaller number of crystals obviously simplifies crystal matching and tuning of the assembled circuit.

Another interesting simulation experiment: I used 5 crystals and did away with all the series and shunt capacitors and put unity gain buffer amps between the stages. Four amps total--no amp at input and output. I made the source and load 50 ohms. Then I put a 100 ohm load at the output of each crystal. I got a very nice response with a bandwidth something like 900 Hz, and ultimate attenuation of at least 110 dB. I reduced all the crystal loads to 50 ohms, and the bandwidth narrowed to about 500 Hz. This general idea was discussed long ago, based on an HP design that varied the loads with PIN diodes in order to change the bandwidth. But it also is a nice simple design to get a narrow bandwidth which you can adjust during assembly to get your target bandwidth. For real-world crystals, the frequencies of the crystals can be adjusted to identical values with series capacitors, and there is no reason that the final response should have any ripple whatsoever.

It appears that the 500 Hz buffered filter could be done with 4 crystals and still get good response. This would require only 3 amps, which could be tiny inexpensive op amps, in order to achieve good power supply rejection. One stage could have gain to eliminate the filter loss.

Sam W.

7503. Re: Crystal Ladder Filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-25 18:01:11 UTC
From: Sam
Topic: 7501 Message: 7503

That would be a good idea if all my filters had this design, but I'm only going to do it for the narrowest. It could work for wider filters, but you would have to add more crystals.

I think I have found the optimal approach: Create two 2-crystal filters. Connect them with a buffer amp. This basically doubles the dB values of attenuation at every point, without creating any resonance interaction between the two filters, so each pair can be independently tuned. Connect 50-ohm source and load, and load the two inner crystals with 50 ohms. If you like what you get, adjust the amp gain to reduce the loss. If you want a broader bandwidth, then all the 50-ohms need to be increased (which will also reduce the loss). Because the amp is in the middle, it probably can only be used to offset the loss of the first half of the filter; otherwise the second half might get overloaded.

In simulations, it appears that if a crystal is mis-tuned, the loss increases and a small bump appears on the side of the response. Mis-tuning never seems to create ripple on the peak. Ripple only arises if the coupling capacitors between each pair of crystals are too small (i.e. too much coupling). So if you see ripple, you know exactly what capacitor to adjust and which way to adjust it.

Tuning a crystal is done with a series capacitor. Reducing the capacitance increases the crystal frequency. The idea is to get all crystals to the same frequency. If they are close to begin with, maybe no tuning is required.

The circuit does not seem very sensitive to input and output reactances. I put shunt 10 pF on the input and saw no change.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Sam,
> As a side note, if planning to add gain within a filter, you could actually eliminate the need for the I.F. Amplifier in the MSA. Just make the total gain of the "Amplifilter" about 35 dB.
> Scotty
>
> --- On Mon, 1/24/11, Sam <swetterlin@...> wrote:
>
> From: Sam <swetterlin@...>
> Subject: [spectrumanalyzer] Crystal Ladder Filters
> To: spectrumanalyzer@yahoogroups.com
> Date: Monday, January 24, 2011, 5:10 PM
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> I have not actually built a crystal ladder filter, but I have tested some crystals and used the results to simulate some filters. I'm looking at bandwidth in the 500-1000 Hz range. Before I started playing with the simulations, I assumed that getting a good response with a narrow bandwidth might require more crystals than for a wider bandwidth. Exactly the opposite seems to be the case, as the simulation results are very good for a 800 Hz filter with 4 crystals and a 500 Hz filter with 3 crystals. This is good news, as the smaller number of crystals obviously simplifies crystal matching and tuning of the assembled circuit.
>
>
>
> Another interesting simulation experiment: I used 5 crystals and did away with all the series and shunt capacitors and put unity gain buffer amps between the stages. Four amps total--no amp at input and output. I made the source and load 50 ohms. Then I put a 100 ohm load at the output of each crystal. I got a very nice response with a bandwidth something like 900 Hz, and ultimate attenuation of at least 110 dB. I reduced all the crystal loads to 50 ohms, and the bandwidth narrowed to about 500 Hz. This general idea was discussed long ago, based on an HP design that varied the loads with PIN diodes in order to change the bandwidth. But it also is a nice simple design to get a narrow bandwidth which you can adjust during assembly to get your target bandwidth. For real-world crystals, the frequencies of the crystals can be adjusted to identical values with series capacitors, and there is no reason that the final response should have any ripple whatsoever.
>
>
>
> It appears that the 500 Hz buffered filter could be done with 4 crystals and still get good response. This would require only 3 amps, which could be tiny inexpensive op amps, in order to achieve good power supply rejection. One stage could have gain to eliminate the filter loss.
>
>
>
> Sam W.
>

7504. help

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-26 16:47:09 UTC
From: wb7dmx@att.net
Topic: 5081 Message: 7504

been a while sence last post, but I have moved to Florida.

looking for some advice on a spectrum analyzer.

I have a chance to buy a AILTECH 707 spectrum analyzer, it covers from 1 Mhz to 12.4 Gig. what I need to know is does anyone know of this device and will I be able to use it to test the vatiuos stages and cavity filter for the one we are building, mine is still packed away and want to get back to finishing it.
thank you.
bob bailey
WB7DMX

7505. Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-27 04:48:51 UTC
From: pzerkel
Topic: 7492 Message: 7505

I made up a SMA connector with two 22K resistors in parallel.

With that connected to the magnitude J1 jumper I get right at 1 mv at J1 (meter waivers between 0.7 and 1.1 mV).

I made up a very simple voltage divider with 3 AAA batteries and a single 25K pot. At first I was getting a magnitude trace which trended up and down as the potentiometer was adjusted (but it was not a straight horizontal line ever).

Now the magnitude trace is not moving at all. It is a straight line at the bottom of the graph.

I removed both AD7685s and moved the one that was in the phase position to the magnitude position... Still nothing on the graph.

Anything else to try before I order two more AD7685s?

7506. Re: [spectrumanalyzer] Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-27 11:47:33 UTC
From: Jurgen
Topic: 7492 Message: 7506

Did you look at the serial data out. I just experienced something similar, initially my trace was stuck at the bottom and then for what ever reasons it got stuck at the top after I fixed a connector problem with my parallel interface.
Only a single bit changed. I also notice that the input pulled the applied voltage from a high impedance source to the positive.
I replaced the A/D and now it works fine.

Jurgen

On 1/26/2011 11:48 PM, pzerkel wrote:
>
> I made up a SMA connector with two 22K resistors in parallel.
>
> With that connected to the magnitude J1 jumper I get right at 1 mv at
> J1 (meter waivers between 0.7 and 1.1 mV).
>
> I made up a very simple voltage divider with 3 AAA batteries and a
> single 25K pot. At first I was getting a magnitude trace which trended
> up and down as the potentiometer was adjusted (but it was not a
> straight horizontal line ever).
>
> Now the magnitude trace is not moving at all. It is a straight line at
> the bottom of the graph.
>
> I removed both AD7685s and moved the one that was in the phase
> position to the magnitude position... Still nothing on the graph.
>
> Anything else to try before I order two more AD7685s?
>
>

7507. Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-27 14:21:27 UTC
From: Sam
Topic: 7492 Message: 7507

1 mV is a bit higher than I expected, but I don't know that it would cause any problem. But it is odd that it would jump around, and also odd that the display line was not level. So a bad IC seems likely. I suggest trying one or both ICs as the phase ADC. You should be able to generate a moving line there as well. The fact that the line suddenly dropped to the bottom makes me suspicious of communication from the latch, since neither IC now works. You might check the toggling action on the latch pins.

If you apply your variable voltage to the phase ADC, be aware that there will be some crazy action at the lowest and highest voltages that will look like massive noise. For example, at 0V the MSA will read that as 0 degrees, invert the non-existent PDM to get out of the dead zone, and then read 0 degrees again, add 180 to account for the inversion, and display a final value of 180 degrees. At the next point, it will repeat the process but the PDM will end up in the non-inverted position, so the final value will be zero. The display will bounce back and forth between those values until you raise the voltage high enough to be out of the dead zone, at which time the display will become a flat line at one of two possible values (depending on the final state of the PDM inversion). That line will then move up and down as you vary the voltage, until you get into the dead zone (below 1V or above 4V, as I recall).

Revisiting ESD: It's nice to be able to test module by module, but be aware that when you have the control board and ADC module lying on your benchtop, they are far more exposed than when they are enclosed in the MSA case. You could zap a latch by simply touching the wiring between the modules if static discharges into the wires.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> Did you look at the serial data out. I just experienced something
> similar, initially my trace was stuck at the bottom and then for what
> ever reasons it got stuck at the top after I fixed a connector problem
> with my parallel interface.
> Only a single bit changed. I also notice that the input pulled the
> applied voltage from a high impedance source to the positive.
> I replaced the A/D and now it works fine.
>
> Jurgen
>
>
>
> On 1/26/2011 11:48 PM, pzerkel wrote:
> >
> > I made up a SMA connector with two 22K resistors in parallel.
> >
> > With that connected to the magnitude J1 jumper I get right at 1 mv at
> > J1 (meter waivers between 0.7 and 1.1 mV).

> >
> > I made up a very simple voltage divider with 3 AAA batteries and a
> > single 25K pot. At first I was getting a magnitude trace which trended
> > up and down as the potentiometer was adjusted (but it was not a
> > straight horizontal line ever).
> >
> > Now the magnitude trace is not moving at all. It is a straight line at
> > the bottom of the graph.
> >
> > I removed both AD7685s and moved the one that was in the phase
> > position to the magnitude position... Still nothing on the graph.
> >
> > Anything else to try before I order two more AD7685s?
> >
> >
>

7509. Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-27 17:34:40 UTC
From: pzerkel
Topic: 7492 Message: 7509

Re: ADC trouble shooting

Sam,

Is it safe to assume that if the control board is still passing all the tests, then the latch pins are okay? I made up a little board with 8 LEDs and resistors and a nine-pin connector to test the CB with. It still seems to work as expected when running the CB test program.

-Paul Zerkel

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>

>communication from the latch, since neither IC now works. You might check the toggling action on the latch pins.
>

7510. Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-27 17:54:51 UTC
From: Sam
Topic: 7492 Message: 7510

It is possible to have a latch output that is slow, or doesn't produce full voltage, but those are hard to test for. You should check that the ADC output is toggling while a scan is active; if it is, it is probably getting the necessary commands. (Maybe you need to have some input voltage, so it is not outputting all zeroes.)

You should also use the CB tester to see whether the MSA can read the ADC outputs; you probably need to disconnect the ADC and connect those parallel port lines to 0 or +5 (you should have pull-up resistors on those lines on the control board, so if you connect nothing the voltage will be +5). Scotty's CB tester and the one in the beta software can test read the "control" lines that the ADC connects to; I don't recall if my tester does that.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "pzerkel" <pzerkel@...> wrote:
>
>
>
> Re: ADC trouble shooting
>
> Sam,
>
> Is it safe to assume that if the control board is still passing all the tests, then the latch pins are okay? I made up a little board with 8 LEDs and resistors and a nine-pin connector to test the CB with. It still seems to work as expected when running the CB test program.
>
> -Paul Zerkel
>
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
>
> >communication from the latch, since neither IC now works. You might check the
> toggling action on the latch pins.
> >
>

7511. Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-27 23:44:37 UTC
From: Len Spyker
Topic: 7492 Message: 7511

Hints for MSA trouble shooting

Please be aware that all your various mains powered sources and test equipment are usually FLOATING.

These units on their own can all be at various nasty AC/DC potentials and many contain mains filter caps etc.

BEFORE YOU START:

Ensure all PC and power suplies and test equipment "OV + "earths" are all joined with separate good earth strap.

DO NOT rely on the MSA to become the only common earth point when every is connected.

Otherwise when you unplug/plug various modules you make/separate these "floating" earths too.

Murphy's law states that with any connector the signal pins always make first before the GND pins and disconnect last.

Regards

Len Spyker

7512. Announcing an MSA Filter plus GROUP BUY

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-29 02:01:24 UTC
From: jghbeta
Topic: 7512 Message: 7512

Hi everyone,

I am organizing a PCB-only Group-Buy which is described in detail below. As you will see, there is much more than filters but RBW filters are the main theme.

2 each 5 pole filters
1 each 4 pole filters
1 each amplifilters
2 each ceramic filters
2 each low pass filters
1 each updated video filter switch board
1 each updated W1JGH power meter
1 High isolation SPDT
1 VHF Transmission/Reflection switch
1 AADE accessory board to measure SMDs

All filters have provisions to utilize surface mounts trimmer capacitors. The series TZY2 trimmers from Murata (available at Digikey) has prices comparable to the good quality ceramics., but the boards have pads that also allow for the larger 1/4 inch sizes. The ceramic filter pcb is a variation of the one available in October's group buy, it is slightly larger and also includes pads for trimmers. This board is well suited for wider bandwidths.

The amplifilter is Sam's new addition to the arsenal. It will house 4 crystals with a buffer in the middle. A very intriguing experimental design.

The power meter auxiliary board is designed for the MiniCircuits ZX47 series power sensors. It simplifies wiring by incorporating the calibrating pot, led and switch in the board itself. I'll have a set of assembly pictures in the next few days.

There is an updated PCB for the video filter switch incorporating the latest refinements from Sam W.

The SPDT is Sam W design for a generic PE4251 filter that may be used as a band or a transmission/ reflection switch. It has very good isolation up to 1GHz (90 dB)

The VHF transmission/ reflection bridge is Sam W implementation of an S-parameter test set that should be good through 300 MHz or so, and should be superb to 100 or 150 MHz. It contains a buffer amp, a bridge, and a relay to select transmission or reflection. It's not really a full-blown S-parameter test set because it cannot reverse the DUT. It should be accurate without the use of 6-term or 12-term calibration, and any mechanism to reverse the DUT screws that up. To use it, the DUT is connected between the DUT port of the bridge and the input of the buffer amp. This lets the DUT see solid 50 ohms on each end regardless of the relay setting. The relay selects the bridge output for reflection and the buffer amp output for transmission. We will publish the schematics in a couple of days.
The AADE accessory board l fits in the terminals of the AADE L/C meter. It may be left permanently in place without interfering with normal operation. By simply placing the SMD

device in the proper position and holding it in place with a transparent plastic strip (held down by scotch tape) will let you determine their values. It will allow for parallel and series combinations of components.

+++++++++

I am preparing a document with pictures, schematics, etc. There maybe a couple of additional boards from Sam that may be added. Any suggestions are most welcome.

I need expressions of interest from some brave souls and after that we will move quickly to the actual ordering. So that we don't overload the mail system, please address them to me directly: jghalpha(at)gmail(dot)com. Based on the number of interested parties I should be able to get a quote. My estimate is that this board will be around 30-40 bucks.

Jim W1JGH

7513. Spectrum analyzers via USB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-29 11:37:54 UTC
From: la2sar
Topic: 7513 Message: 7513

Hi i wander about, can i redo my TARGUS USB Dongle
and make it a spectrum analyzer?

This TARGUS is a AMW07 with bellonging USB dongle at 2.4GHz!

Do i need reprogramming, by redo firmware here?
I that case, what is the FIRMWARE i need and,
what chipset is it on this dongle?

7514. Re: [spectrumanalyzer] Spectrum analyzers via USB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-29 12:52:39 UTC
From: Jim Hontoria
Topic: 7513 Message: 7514

No
Jim

On Sat, Jan 29, 2011 at 6:37 AM, la2sar <catopett@...> wrote:

>
>
> Hi i wander about, can i redo my TARGUS USB Dongle
> and make it a spectrum analyzer?
>
> This TARGUS is a AMW07 with bellonging USB dongle at 2.4GHz!
>
> Do i need reprogramming, by redo firmware here?
> I that case, what is the FIRMWARE i need and,
> what chipset is it on this dongle?
>
>
>

--
Jim G. Hontoria

7515. MSA front panel connections

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-29 15:57:50 UTC
From: jghbeta
Topic: 7515 Message: 7515

I am in the process of redesigning the front panel to include the signal router. Has anyone come up with a good design?
Jim

7516. Re: [spectrumanalyzer] Spectrum analyzers via USB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-29 19:42:54 UTC
From: Cato Pettersen transport
Topic: 7513 Message: 7516

NO, means?
No means, YES, i may use it as SPECTRUM ANALYZER witout reprogramming firmware?

----- Original Message -----
From: Jim Hontoria
To: spectrumanalyzer@yahoogroups.com
Sent: Saturday, January 29, 2011 1:52 PM
Subject: Re: [spectrumanalyzer] Spectrum analyzers via USB

No
Jim

On Sat, Jan 29, 2011 at 6:37 AM, la2sar <catopett@...> wrote:

Hi i wander about, can i redo my TARGUS USB Dongle
and make it a spectrum analyzer?

This TARGUS is a AMW07 with bellonging USB dongle at 2.4GHz!

Do i need reprogramming, by redo firmware here?
I that case, what is the FIRMWARE i need and,
what chipset is it on this dongle?

--
Jim G. Hontoria

7517. Re: Spectrum analyzers via USB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-29 21:08:08 UTC
From: Sam
Topic: 7513 Message: 7517

The question is not very clear. If the question is taken literally and is asking whether the Targus can be used as a spectrum analyzer, the answer is no, because it is just a communication device. If the question is whether the Targus can be used as an interface to the MSA, the answer is "possibly". I don't know much about it, but once USB is implemented on the MSA, perhaps a Targus device could be used on each end so both the MSA and PC would think they are communicating by USB, but there would be a bluetooth link involved in the middle. However, I suspect it would be slow.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Cato Pettersen transport" <catopett@...> wrote:
>
> NO, means?
> No means, YES, i may use it as SPECTRUM ANALYZER witout reprogramming firmware?
>
> ----- Original Message -----
> From: Jim Hontoria
> To: spectrumanalyzer@yahoogroups.com
> Sent: Saturday, January 29, 2011 1:52 PM
> Subject: Re: [spectrumanalyzer] Spectrum analyzers via USB
>
>
>
>
> No
> Jim
>
>
> On Sat, Jan 29, 2011 at 6:37 AM, la2sar <catopett@...> wrote:
>
>
> Hi i wander about, can i redo my TARGUS USB Dongle
> and make it a spectrum analyzer?
>
> This TARGUS is a AMW07 with bellonging USB dongle at 2.4GHz!
>
> Do i need reprogramming, by redo firmware here?
> I that case, what is the FIRMWARE i need and,
> what chipset is it on this dongle?
>
>
>
>
>
>
> --

> Jim G. Hontoria
>

7518. Re: [spectrumanalyzer] Spectrum analyzers via USB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-29 21:11:39 UTC
From: Jim Hontoria
Topic: 7513 Message: 7518

No, means no to the first question. The second question becomes irrelevant then.

I have an old spark plug and a couple of nuts in my junk box. Can I build a car with them? What kind of gas should I use?

Jim.

On Sat, Jan 29, 2011 at 2:42 PM, Cato Pettersen transport <catopett@...
> wrote:

>
>
> NO, means?
> No means, YES, i may use it as SPECTRUM ANALYZER witout reprogramming
> firmware?
>
>
> ----- Original Message -----
> *From:* Jim Hontoria <jghalpha@...>
> *To:* spectrumanalyzer@yahoogroups.com
> *Sent:* Saturday, January 29, 2011 1:52 PM
> *Subject:* Re: [spectrumanalyzer] Spectrum analyzers via USB
>
>
>
> No
> Jim
>
> On Sat, Jan 29, 2011 at 6:37 AM, la2sar <catopett@...> wrote:
>
>>
>>
>> Hi i wander about, can i redo my TARGUS USB Dongle
>> and make it a spectrum analyzer?
>>
>> This TARGUS is a AMW07 with bellonging USB dongle at 2.4GHz!
>>
>> Do i need reprogramming, by redo firmware here?
>> I that case, what is the FIRMWARE i need and,
>> what chipset is it on this dongle?
>>
>>
>
>
> --

> Jim G. Hontoria
>
>
>

--
Jim G. Hontoria

7519. Spectrum analyzers via USB "Advantest 3361A "

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-29 23:09:44 UTC
From: Cato Pettersen transport
Topic: 7513 Message: 7519

need to know if it is possible to make a cable
for controlling the Advantest 3361A by "USB" PC/Laptop?

Is there a type of software who i can use
for communication with this instrument,
in stead of the raytube on this instrument?

Or, is there a mod for swapping this hivoltage raytube with LCD?

7520. Re: Announcing an MSA Filter plus GROUP BUY

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-29 23:22:05 UTC
From: Sam
Topic: 7512 Message: 7520

Just wanted to add some thoughts on a couple of these boards.

The "amplifilter" (I'm using Scotty's term, though the gain is not enough to replace the IF amp) has two crystals, then a buffer amp, then two more crystals. Hopefully it will make a very narrow RBW filter (400-800 Hz?) that will be fairly easy to tune.

The "VHF Transmission/Reflection Set" combines a bridge and buffer amp with a transmission/reflection switch. "VHF" is intended to convey that it does not cover the full range to 1 GHz, though it does also cover far below VHF, to 250 kHz or so, depending how big you make the capacitors. It could also do a nice job of displaying return loss from 250 kHz to 100 MHz with just a spectrum analyzer with TG.

The SPDT is a compact high-isolation solid-state switch. I have not built this exact one, but a similar switch performed very well. It uses 3 very cheap PE4251s.

The video filter board is the same as the one I am using now, with fixes to a couple of traces and pads.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> Hi everyone,
>
> I am organizing a PCB-only Group-Buy which is described in detail below. As you will see, there is much more than filters but RBW filters are the main theme.
>
> 2 each 5 pole filters
> 1 each 4 pole filters
> 1 each amplifilters
> 2 each ceramic filters
> 2 each low pass filters
> 1 each updated video filter switch board
> 1 each updated W1JGH power meter
> 1 High isolation SPDT
> 1 VHF Transmission/Reflection switch
> 1 AADE accessory board to measure SMDs
>
> All filters have provisions to utilize surface mounts trimmer capacitors. The series TZY2 trimmers from Murata (available at Digikey) has prices comparable to the good quality ceramics., but the boards have pads that also allow for the larger 1/4 inch sizes. The ceramic filter pcb is a variation of the one available in October's group buy, it is slightly larger and also includes pads for trimmers. This board is well suited for wider bandwidths.
>
> The amplifilter is Sam's new addition to the arsenal. It will house 4 crystals with a

buffer in the middle. A very intriguing experimental design.
>
> The power meter auxiliary board is designed for the MiniCircuits ZX47 series power sensors. It simplifies wiring by incorporating the calibrating pot, led and switch in the board itself. I'll have a set of assembly pictures in the next few days.
>
> There is an updated PCB for the video filter switch incorporating the latest refinements from Sam W.
>
> The SPDT is Sam W design for a generic PE4251 filter that may be used as a band or a transmission/ reflection switch. It has very good isolation up to 1GHz (90 dB)
>
> The VHF transmission/ reflection bridge is Sam W implementation of an S-parameter test set that should be good through 300 MHz or so, and should be superb to 100 or 150 MHz. It contains a buffer amp, a bridge, and a relay to select transmission or reflection. It's not really a full-blown S-parameter test set because it cannot reverse the DUT. It should be accurate without the use of 6-term or 12-term calibration, and any mechanism to reverse the DUT screws that up. To use it, the DUT is connected between the DUT port of the bridge and the input of the buffer amp. This lets the DUT see solid 50 ohms on each end regardless of the relay setting. The relay selects the bridge output for reflection and the buffer amp output for transmission. We will publish the schematics in a couple of days.
> The AADE accessory board l fits in the terminals of the AADE L/C meter. It may be left permanently in place without interfering with normal operation. By simply placing the SMD device in the proper position and holding it in place with a transparent plastic strip (held down by scotch tape) will let you determine their values. It will allow for parallel and series combinations of components.
>
> +++++++++
>
> I am preparing a document with pictures, schematics, etc. There maybe a couple of additional boards from Sam that may be added. Any suggestions are most welcome.
>
> I need expressions of interest from some brave souls and after that we will move quickly to the actual ordering. So that we don't overload the mail system, please address them to me directly: jghalpha(at)gmail(dot)com. Based on the number of interested parties I should be able to get a quote. My estimate is that this board will be around 30-40 bucks.
>
> Jim W1JGH
>

7521. Re: [spectrumanalyzer] Spectrum analyzers via USB "Advantest 3361A "

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-29 23:25:34 UTC
From: william sprowls
Topic: 7513 Message: 7521

Hi Cato,
To answer those questions, someone would have to look at its documentation, including its schematics. And, I doubt if Advantest will supply them to you, even for a fee.
Scotty

--- On Sat, 1/29/11, Cato Pettersen transport <catopett@...> wrote:

From: Cato Pettersen transport <catopett@...>
Subject: [spectrumanalyzer] Spectrum analyzers via USB "Advantest 3361A "
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, January 29, 2011, 5:09 PM

need to know if it is possible to make a cable

for controlling the Advantest 3361A by "USB"
PC/Laptop?

Is there a type of software who i can use

for communication with this instrument,

in stead of the raytube on this
instrument?

Or, is there a mod for swapping this hivoltage
raytube with LCD?

7522. Advantest 3361A

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-30 00:05:06 UTC
From: Cato Pettersen transport
Topic: 7513 Message: 7522

I did see a program on tv, where the US marine did track down and spy on Bin-Ladens cellphone with a instrument like mine "Advantest 3361A "

How do i set my Advantest 3361A up so i can listen to cellphones?
Is it used by the connector on back of this instrument,
or.. did thay use the AUDIO-connector in front?

In this way, how do i mannage to listen on trafic via this connector?
I can set up a spectrum screen, look at the spikes,
take one of them as center frequency and monitor it,
i know i can listen to, but, how do i set up doing this?

7523. Advantest 3361A

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-30 00:15:04 UTC
From: Cato Pettersen transport
Topic: 7513 Message: 7523

As rescue RDFer i did find this Advantest 3361A good to find a transmitter as well,
I put in low frequency, and high frequency, in that frequency area we know the transmitter is repported,
and monitor them spikes, and try to sepparate the transmitter from
others on this spectrum-band!

When we find this transmitter, we can listen to it and confirm if it is the right transmitter,
then follow the spike here, and find the direction by monitor the strenght of this spike,
as higher the spike is, as closer the transmitter is!

We just use a vertical yagi here,
do not need to use an antenna array!

7524. Re: [spectrumanalyzer] Advantest 3361A

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-30 01:25:50 UTC
From: w4zcb
Topic: 7513 Message: 7524

Cato, you're getting to be a bit of a nuisance with your off topic questions. Would you mind toning it down and staying within the subject of our group please? With the length and breadth of the Internet, there's likely a place for subjects like yours below, but this isn't it.

W4ZCB

I did see a program on tv, where the US marine did track down and spy on Bin-Ladens cellphone with a instrument like mine "Advantest 3361A "

How do i set my Advantest 3361A up so i can listen to cellphones?
Is it used by the connector on back of this instrument,
or.. did thay use the AUDIO-connector in front?

In this way, how do i mannage to listen on trafic via this connector?
I can set up a spectrum screen, look at the spikes,
take one of them as center frequency and monitor it,
i know i can listen to, but, how do i set up doing this?

7525. Re: [spectrumanalyzer] Advantest 3361A

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-30 08:29:35 UTC
From: Cato Pettersen transport
Topic: 7513 Message: 7525

I forgot to tell, i am using this equippment to SAR/RDF,
but i cannot mannage to take out audio,
for listenning if this is the right frequency to triangulate!

Off topic?
Is this group for Spectrumanalyzer or not?

----- Original Message -----
From: w4zcb
To: spectrumanalyzer@yahoogroups.com
Sent: Sunday, January 30, 2011 2:25 AM
Subject: Re: [spectrumanalyzer] Advantest 3361A

Cato, you're getting to be a bit of a nuisance with your off topic
questions. Would you mind toning it down and staying within the
subject of our group please? With the length and breadth of the
Internet, there's likely a place for subjects like yours below, but
this isn't it.

W4ZCB

I did see a program on tv, where the US marine did track down and spy
on Bin-Ladens cellphone with a instrument like mine "Advantest 3361A "

How do i set my Advantest 3361A up so i can listen to cellphones?
Is it used by the connector on back of this instrument,
or.. did thay use the AUDIO-connector in front?

In this way, how do i mannage to listen on trafic via this connector?
I can set up a spectrum screen, look at the spikes,
take one of them as center frequency and monitor it,
i know i can listen to, but, how do i set up doing this?

7526. Amplifilter amplifiers

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-30 09:00:00 UTC
From: davidhooau
Topic: 7512 Message: 7526

Hi Sam,

I'm going to follow your lead on a narrow RBW filter. I'm about to place an order with Digikey for some other bits, so wondered if you could advise which amps you've chosen so I can buy a couple?

Thanks,

davidh

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Just wanted to add some thoughts on a couple of these boards.
>
> The "amplifilter" (I'm using Scotty's term, though the gain is not enough to replace the IF amp) has two crystals, then a buffer amp, then two more crystals. Hopefully it will make a very narrow RBW filter (400-800 Hz?) that will be fairly easy to tune.
>

7527. 10.7 Mhz Filters by ECS

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-30 14:37:30 UTC
From: Robert Cerreto
Topic: 7527 Message: 7527

Folks,

Take a look at these ECS Filters:

http://cgi.ebay.com/20-ECS-10MHz-Monolithic-Matched-Pair-Crystal-Filters-/200311726923?pt=LH_DefaultDomain_0&hash=item2ea382634b

They might find some application here. I used them in a home built SA some years back and they also serve as a filter in a home brew transceiver.

What do youse think?

Bob

7528. Re: Amplifilter amplifiers

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-30 14:49:39 UTC
From: Sam
Topic: 7512 Message: 7528

Other than resistors/capacitors, it uses
1 OPA842 op amp, SOT-23 package
1 BLM21AG102 ferrite bead
1 L4931CD80 8v LDO regulator
2 Pulse PE-0805CM681JTT 680 nH inductor

The inductors are for 10.7 MHz for 10.1 MHz use the 750 nH equivalent. All these parts are available at Digi-Key, except you can get the op amp at Mouser. I was intending to find one that Digi-Key carries, but haven't done so. The key thing is that it be available in SOT-23 and can operate at 8V with reasonably flat gain to 11 MHz with gain of 4. This probably takes gain-bandwidth product of at least 200 or 300 MHz.

It can use 4 of the trimmers that Jim mentioned, but I am hoping the tuning will be simple enough that trimmers aren't required. If adjustment is required, I'm hoping it can be done by one-time adding or removal of a parallel cap.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Hi Sam,
>
> I'm going to follow your lead on a narrow RBW filter. I'm about to place an order with Digikey for some other bits, so wondered if you could advise which amps you've chosen so I can buy a couple?
>
> Thanks,
>
> davidh
>
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Just wanted to add some thoughts on a couple of these boards.
> >
> > The "amplifilter" (I'm using Scotty's term, though the gain is not enough to replace the IF amp) has two crystals, then a buffer amp, then two more crystals. Hopefully it will make a very narrow RBW filter (400-800 Hz?) that will be fairly easy to tune.
> >
>

7529. Re: 10.7 Mhz Filters by ECS

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-30 14:53:56 UTC
From: Sam
Topic: 7527 Message: 7529

Yes, those can work. I believe someone posted results of a filter built with one of these. Digi-Key carries them.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Robert Cerreto <wa1fxt@...> wrote:
>
> Folks,
>
> Take a look at these ECS Filters:
>
> http://cgi.ebay.com/20-ECS-10MHz-Monolithic-Matched-Pair-Crystal-Filters-/200311726923?pt=LH_DefaultDomain_0&hash=item2ea382634b
>
> They might find some application here. I used them in a home built SA some years back and they also serve as a filter in a home brew transceiver.
>
> What do youse think?
>
> Bob
>

7530. Re: Advantest 3361A

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-30 15:09:41 UTC
From: Sam
Topic: 7513 Message: 7530

As stated in the group intro, this site is for Scotty's Spectrum Analyzer and "similar projects", meaning home-brew analyzers. It is not for broad, open-ended questions about commercial equipment, for which you should consult the operating manual.

I might also add that it rankles me when people expect detailed answers to broad, vague questions into which they have put a Twitter-level of thought. That thought level is often quickly identifiable by consistent failure to capitalize "i". By this I do not mean to discourage broad introductory questions about the MSA.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Cato Pettersen transport" <catopett@...> wrote:
>
> I forgot to tell, i am using this equippment to SAR/RDF,
> but i cannot mannage to take out audio,
> for listenning if this is the right frequency to triangulate!
>
> Off topic?
> Is this group for Spectrumanalyzer or not?
>
> ----- Original Message -----
> From: w4zcb
> To: spectrumanalyzer@yahoogroups.com
> Sent: Sunday, January 30, 2011 2:25 AM
> Subject: Re: [spectrumanalyzer] Advantest 3361A
>
>
>
> Cato, you're getting to be a bit of a nuisance with your off topic
> questions. Would you mind toning it down and staying within the
> subject of our group please? With the length and breadth of the
> Internet, there's likely a place for subjects like yours below, but
> this isn't it.
>
> W4ZCB
>
> I did see a program on tv, where the US marine did track down and spy
> on Bin-Ladens cellphone with a instrument like mine "Advantest 3361A "
>
> How do i set my Advantest 3361A up so i can listen to cellphones?
> Is it used by the connector on back of this instrument,
> or.. did thay use the AUDIO-connector in front?
>
> In this way, how do i mannage to listen on trafic via this connector?
> I can set up a spectrum screen, look at the spikes,
> take one of them as center frequency and monitor it,

> i know i can listen to, but, how do i set up doing this?
>

7531. High impedance bridge

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-30 16:20:47 UTC
From: Sam
Topic: 7531 Message: 7531

I have been fascinated by op-amp based bridges, in part because they can perform nearly perfectly below some frequency (somewhere in the 10-50 MHz range) and can perform very well above that. One thing this lets you do is display return loss graphs using just a spectrum analyzer + tracking generator. In fact, you don't even need a tracking generator, if you have a noise generator or plain-old swept-frequency-generator. Or, with the MSA/VNA, scans can be made with referece calibration, much simpler than OSL.

In some cases, it would be handy for the bridge to have a reference impedance different from 50 ohms. 75 ohms is an obvious possibility, but there are also situations where a much higher impedance would be appropriate. For example, you could get more accurate measurements of MCF filters by using higher impedances. Especially below 30 MHz, many circuits might have impedances much higher than 50 ohms. Likewise, there may be circumstances where it would be nice to have a very low impedance bridge.

I have designed a bridge whose reference impedance can be changed simply. Different high impedances could be selected by changing a single resistor. This single resistor approach will work for 50 ohms and higher. Lower impedances require changing a couple of resistors. The idea of changing resistors probably only works if you do so only occasionally, or if you create some simple switching method or allow plug-in resistors. The latter approach would work, but the goal of "perfect performance" probably limits the frequency range to <10 MHz or so.

I am interested in whether this sort of thing actually appeals to anybody. If so, this board could be added to Jim's board.

Sam W.

7532. Re: Advantest 3361A

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-30 16:39:20 UTC
From: n6tdt
Topic: 7513 Message: 7532

Cato,

The spectrum analyzer group is dedicated to a home brew spectrum analyzer that was designed by William (Scotty) Sprowls

http://www.scottyspectrumanalyzer.com/index.html

I do believe that many members will answer questions if they can but the group centers around this particular project.

There are other groups that discuss various types of spectrum analyzers such as the elect-inst group and the advantestinstrument group.

Best Regards

Dan Ellis
N6TDT

--- In spectrumanalyzer@yahoogroups.com, "Cato Pettersen transport" <catopett@...> wrote:
>
> I forgot to tell, i am using this equippment to SAR/RDF,
> but i cannot mannage to take out audio,
> for listenning if this is the right frequency to triangulate!
>
> Off topic?
> Is this group for Spectrumanalyzer or not?
>
> ----- Original Message -----
> From: w4zcb
> To: spectrumanalyzer@yahoogroups.com
> Sent: Sunday, January 30, 2011 2:25 AM
> Subject: Re: [spectrumanalyzer] Advantest 3361A
>
>
>
> Cato, you're getting to be a bit of a nuisance with your off topic
> questions. Would you mind toning it down and staying within the
> subject of our group please? With the length and breadth of the
> Internet, there's likely a place for subjects like yours below, but
> this isn't it.
>
> W4ZCB
>
> I did see a program on tv, where the US marine did track down and spy
> on Bin-Ladens cellphone with a instrument like mine "Advantest 3361A "
>
> How do i set my Advantest 3361A up so i can listen to cellphones?

> Is it used by the connector on back of this instrument,
> or.. did thay use the AUDIO-connector in front?
>
> In this way, how do i mannage to listen on trafic via this connector?
> I can set up a spectrum screen, look at the spikes,
> take one of them as center frequency and monitor it,
> i know i can listen to, but, how do i set up doing this?
>

7533. Re: [spectrumanalyzer] High impedance bridge

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-30 16:41:26 UTC
From: Jim Hontoria
Topic: 7531 Message: 7533

Sam,

There is more than enough room in board to add the bridge.
As an update, there are 13 users from all over the world who have expressed an interest. So, numbers wise, the board is a go. I will suspect that we willl end up in the 20's.

Jim

On Sun, Jan 30, 2011 at 11:20 AM, Sam <swetterlin@comcast.net> wrote:

>
>
> I have been fascinated by op-amp based bridges, in part because they can
> perform nearly perfectly below some frequency (somewhere in the 10-50 MHz
> range) and can perform very well above that. One thing this lets you do is
> display return loss graphs using just a spectrum analyzer + tracking
> generator. In fact, you don't even need a tracking generator, if you have a
> noise generator or plain-old swept-frequency-generator. Or, with the
> MSA/VNA, scans can be made with referece calibration, much simpler than OSL.
>
> In some cases, it would be handy for the bridge to have a reference
> impedance different from 50 ohms. 75 ohms is an obvious possibility, but
> there are also situations where a much higher impedance would be
> appropriate. For example, you could get more accurate measurements of MCF
> filters by using higher impedances. Especially below 30 MHz, many circuits
> might have impedances much higher than 50 ohms. Likewise, there may be
> circumstances where it would be nice to have a very low impedance bridge.
>
> I have designed a bridge whose reference impedance can be changed simply.
> Different high impedances could be selected by changing a single resistor.
> This single resistor approach will work for 50 ohms and higher. Lower
> impedances require changing a couple of resistors. The idea of changing
> resistors probably only works if you do so only occasionally, or if you
> create some simple switching method or allow plug-in resistors. The latter
> approach would work, but the goal of "perfect performance" probably limits
> the frequency range to <10 MHz or so.
>
> I am interested in whether this sort of thing actually appeals to anybody.
> If so, this board could be added to Jim's board.
>
> Sam W.
>
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>

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Jim G. Hontoria

7534. Re: Amplifilter amplifiers

Yahoo group: spectrumanalyzer (2011)
Date: 2011-01-30 19:25:12 UTC
From: Sam
Topic: 7512 Message: 7534

Correction. Mouser is now out of OPA842. OPA695 would be a good substitute. Mouser has them; Digi-Key does not. OPA356, which Digi-Key has, would likely work, and with that one you could use the normal ua7805L regulator, which the PCB will also accommodate. (In fact, with the OPA356, you have to use the 5V regulator; 8V would blow it.)

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Other than resistors/capacitors, it uses
> 1 OPA842 op amp, SOT-23 package
> 1 BLM21AG102 ferrite bead
> 1 L4931CD80 8v LDO regulator
> 2 Pulse PE-0805CM681JTT 680 nH inductor
>
> The inductors are for 10.7 MHz for 10.1 MHz use the 750 nH equivalent. All these parts are available at Digi-Key, except you can get the op amp at Mouser. I was intending to find one that Digi-Key carries, but haven't done so. The key thing is that it be available in SOT-23 and can operate at 8V with reasonably flat gain to 11 MHz with gain of 4. This probably takes gain-bandwidth product of at least 200 or 300 MHz.
>
> It can use 4 of the trimmers that Jim mentioned, but I am hoping the tuning will be simple enough that trimmers aren't required. If adjustment is required, I'm hoping it can be done by one-time adding or removal of a parallel cap.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> >
> > Hi Sam,
> >
> > I'm going to follow your lead on a narrow RBW filter. I'm about to place an order with Digikey for some other bits, so wondered if you could advise which amps you've chosen so I can buy a couple?
> >
> > Thanks,
> >
> > davidh
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > Just wanted to add some thoughts on a couple of these boards.
> > >
> > > The "amplifilter" (I'm using Scotty's term, though the gain is not enough to replace

the IF amp) has two crystals, then a buffer amp, then two more crystals. Hopefully it will make a very narrow RBW filter (400-800 Hz?) that will be fairly easy to tune.
> > >
> >
>

7535. MSA_Collection_7_6_10

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-01 03:34:44 UTC
From: davidhooau
Topic: 7535 Message: 7535

Hi Folks,

Does anyone have a spare MSA_Collection panel available for purchase?

Many thanks,

davidh

7536. Re: USB Questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-01 23:00:59 UTC
From: b767_fan
Topic: 7416 Message: 7536

Hi folks,

What is the easiest method to add USB to an existing parallel port control board? Expense is not as much an issue as trying to rewire or re-code to accommodate that.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> Hi Neal,
> This is my take on the subject:
> - I have been running Windows 7 64 bit
> - Release 116, as released a couple of days ago, supports USB. Not all the
> functionality is still available, for example, only the resolution filters
> are selectable. There is only one version of the software both usable with
> USB or the control board.
> - The pin assignments to the CB are correct. I run USB like that up to a
> couple of days ago. I am in the process of moving everything to a new box
> that will not use the CB: only USB. I HAVE CONFIGURED USB ALREADY AND THE
> SOFTWARE IS TALKING TO THE HARDWARE. AS WE SPEAK, I AM STILL TESTING.
> - I have had issues with the installation USB drivers that Dave is helping
> me with.
>
> I hope the above is of some help.
>
> Jim W1JGH
>
> On Sun, Jan 9, 2011 at 1:20 PM, Sam <swetterlin@...> wrote:
>
> >
> >
> > Neal,
> > The next release of the software, for which the beta has been posted, will
> > provide full USB support by making calls to Dave's driver. You would use the
> > Configuration Manager to tell the MSA software that you are using USB rather
> > than the parallel port. I'll let Dave respond as to the details of the
> > driver.
> >
> > The general plan is to be able to allow users to control the MSA through
> > the existing control board or directly, bypassing the control board. My plan
> > is to wire an off-the-shelf Cypress board ($30) to the parallel port input
> > of the control board. I suppose in theory it is slower to run the data
> > through the existing control board, but I doubt there would be a measurable
> > speed hit. USB likely will be faster than the parallel port, so the dominant
> > factor in determining overall speed will be the processing of data, not
> > communication with the hardware. In VNA modes, the dominant timing factor
> > will generally be the amount of wait time needed to allow full settling.

> >
> > I don't know of anyone designing a direct control board replacement that
> > would contain the Cypress chip. For anyone who directly wires a Cypress
> > board to the modules, I did design a board that provides +10V and +23V
> > supplies--a similar concept to the Control Board but without the latches.
> > That board was included with the Signal Router board for which there was a
> > recent group buy.
> >
> > It might be feasible for someone to merge the layout of the +10/+23V board
> > with a Cypress board layout such as Dave Brainerd's.
> >
> > Sam W.
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com<spectrumanalyzer%40yahoogroups.com>,
> > "nealmartini" <nealmartini@> wrote:
> > >
> > > Sam, David, & Others USB Knowledgeables,
> > >
> > > I am trying to understand the documentation I find in the group files
> > w.r.t. USB an dthe MSA. I am not very well versed in USB, so I apologize if
> > some of my questions are naive. Here are a few questions I have:
> > >
> > > 1. Does the latest MSA software release have full support for USB,
> > including the .dll and menu select options? Or is there a special version of
> > the software for USB support?
> > >
> > > 2. If the answer to number 1. is yes, does the included driver assume the
> > pin assignments shown in the files document for connecting a CY68013A USB
> > controller board to an existing MSA Control Board?
> > >
> > > 3. If you connect a CY68013A USB controller board to an existing Control
> > Board, is there any throughput hit?
> > >
> > > 4. I assume it is WIN7 compatible.
> > >
> > > 5. Is someone designing a SLIM version of a USB board that can be used in
> > place of the current MSA Control Board.
> > >
> > > Sorry for all the questions. Thanks in advance for your help on this.
> > >
> > > Neal
> > >
> >
> >
> >
>
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> --

> Jim G. Hontoria
>

7537. Re: USB Questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-01 23:24:27 UTC
From: Sam
Topic: 7416 Message: 7537

You can buy an assembled Cypress board on eBay. I bought one for about $30, though I have yet to do anything with it. You just need to connect the appropriate pins of the Cypress to a male parallel port connector, and plug that into the control board. I understand that the pin assignments are in Dave's documentation on this site, and that Jim has gotten his MSA to work using this approach. Operation of switches other than the RBW switch is not yet supported in USB, but hopefully will be soon.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "b767_fan" <b767_fan@...> wrote:
>
> Hi folks,
>
> What is the easiest method to add USB to an existing parallel port control board? Expense is not as much an issue as trying to rewire or re-code to accommodate that.
>
> --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@> wrote:
> >
> > Hi Neal,
> > This is my take on the subject:
> > - I have been running Windows 7 64 bit
> > - Release 116, as released a couple of days ago, supports USB. Not all the
> > functionality is still available, for example, only the resolution filters
> > are selectable. There is only one version of the software both usable with
> > USB or the control board.
> > - The pin assignments to the CB are correct. I run USB like that up to a
> > couple of days ago. I am in the process of moving everything to a new box
> > that will not use the CB: only USB. I HAVE CONFIGURED USB ALREADY AND THE
> > SOFTWARE IS TALKING TO THE HARDWARE. AS WE SPEAK, I AM STILL TESTING.
> > - I have had issues with the installation USB drivers that Dave is helping
> > me with.
> >
> > I hope the above is of some help.
> >
> > Jim W1JGH
> >
> > On Sun, Jan 9, 2011 at 1:20 PM, Sam <swetterlin@> wrote:
> >
> > >
> > >
> > > Neal,
> > > The next release of the software, for which the beta has been posted, will
> > > provide full USB support by making calls to Dave's driver. You would use the
> > > Configuration Manager to tell the MSA software that you are using USB rather
> > > than the parallel port. I'll let Dave respond as to the details of the

> > > driver.
> > >
> > > The general plan is to be able to allow users to control the MSA through
> > > the existing control board or directly, bypassing the control board. My plan
> > > is to wire an off-the-shelf Cypress board ($30) to the parallel port input
> > > of the control board. I suppose in theory it is slower to run the data
> > > through the existing control board, but I doubt there would be a measurable
> > > speed hit. USB likely will be faster than the parallel port, so the dominant
> > > factor in determining overall speed will be the processing of data, not
> > > communication with the hardware. In VNA modes, the dominant timing factor
> > > will generally be the amount of wait time needed to allow full settling.
> > >
> > > I don't know of anyone designing a direct control board replacement that
> > > would contain the Cypress chip. For anyone who directly wires a Cypress
> > > board to the modules, I did design a board that provides +10V and +23V
> > > supplies--a similar concept to the Control Board but without the latches.
> > > That board was included with the Signal Router board for which there was a
> > > recent group buy.
> > >
> > > It might be feasible for someone to merge the layout of the +10/+23V board
> > > with a Cypress board layout such as Dave Brainerd's.
> > >
> > > Sam W.
> > >
> > >
> > > --- In spectrumanalyzer@yahoogroups.com<spectrumanalyzer%40yahoogroups.com>,
> > > "nealmartini" <nealmartini@> wrote:
> > > >
> > > > Sam, David, & Others USB Knowledgeables,
> > > >
> > > > I am trying to understand the documentation I find in the group files
> > > w.r.t. USB an dthe MSA. I am not very well versed in USB, so I apologize if
> > > some of my questions are naive. Here are a few questions I have:
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> > > > 1. Does the latest MSA software release have full support for USB,
> > > including the .dll and menu select options? Or is there a special version of
> > > the software for USB support?
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> > > > 2. If the answer to number 1. is yes, does the included driver assume the
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> > > controller board to an existing MSA Control Board?
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> > > Board, is there any throughput hit?
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> > > > 4. I assume it is WIN7 compatible.
> > > >
> > > > 5. Is someone designing a SLIM version of a USB board that can be used in
> > > place of the current MSA Control Board.
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> > > > Sorry for all the questions. Thanks in advance for your help on this.
> > > >
> > > > Neal
> > > >
> > >
> > >
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> > --
> > Jim G. Hontoria
> >
>

7538. Re: [spectrumanalyzer] Re: USB Questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-01 23:34:41 UTC
From: william sprowls
Topic: 7416 Message: 7538

Hi Fan,
Here is my understanding. There will be one USB board. It is already designed and in use for other projects. It has the standard USB input connector, and output pin connections.
 If this board is used to completely eliminate the SLIM Control Board, the wiring will connect from this USB Board to the SLIM Modules.
If this board is used to control the SLIM Control Board, it will wire to a male, DB25 connector that will plug into the female of the SLIM Control Board.
 The software will have the provision to be "told" to use "USB Only" or "USB/Parallel".
The software is still in the beta test mode.
Scotty

--- On Tue, 2/1/11, b767_fan <b767_fan@...> wrote:

From: b767_fan <b767_fan@...>
Subject: [spectrumanalyzer] Re: USB Questions
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, February 1, 2011, 5:00 PM

Hi folks,

What is the easiest method to add USB to an existing parallel port control board? Expense is not as much an issue as trying to rewire or re-code to accommodate that.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:

>

> Hi Neal,

> This is my take on the subject:

> - I have been running Windows 7 64 bit

> - Release 116, as released a couple of days ago, supports USB. Not all the

> functionality is still available, for example, only the resolution filters

> are selectable. There is only one version of the software both usable with

> USB or the control board.

> - The pin assignments to the CB are correct. I run USB like that up to a

> couple of days ago. I am in the process of moving everything to a new box

> that will not use the CB: only USB. I HAVE CONFIGURED USB ALREADY AND THE

> SOFTWARE IS TALKING TO THE HARDWARE. AS WE SPEAK, I AM STILL TESTING.

> - I have had issues with the installation USB drivers that Dave is helping

> me with.

>

> I hope the above is of some help.

>

> Jim W1JGH

>

> On Sun, Jan 9, 2011 at 1:20 PM, Sam <swetterlin@...> wrote:

>

> >

> >

> > Neal,

> > The next release of the software, for which the beta has been posted, will

> > provide full USB support by making calls to Dave's driver. You would use the

> > Configuration Manager to tell the MSA software that you are using USB rather

> > than the parallel port. I'll let Dave respond as to the details of the

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> >

> > Sam W.

> >

> >

> > --- In spectrumanalyzer@yahoogroups.com<spectrumanalyzer%40yahoogroups.com>,

> > "nealmartini" <nealmartini@> wrote:

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> > > 1. Does the latest MSA software release have full support for USB,

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> > Board, is there any throughput hit?

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> > > 4. I assume it is WIN7 compatible.

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> > place of the current MSA Control Board.

> > >

> > > Sorry for all the questions. Thanks in advance for your help on this.

> > >

> > > Neal

> > >

> >

> >

> >

>

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>

> --

> Jim G. Hontoria

>

7539. RE: [spectrumanalyzer] Re: USB Questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-02 00:03:31 UTC
From: Jim Hontoria
Topic: 7416 Message: 7539
Attachments: 2 described; binary payloads are missing from this source WARC

The board I bought in eBay was the EZ-USB FX2XLP. It has a 128 pin Cypress chip and more pins and functionality than required for the MSA as it stands today. It works well if set up following carefully Dave’s instructions. A hint: use individual connectors for each wire. This allows you to go from the control board to the USB board easily. I am currently running from the control board because of the lack of implementation of the P4 switches (except the RBW).

Jim

From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of william sprowls
Sent: Tuesday, February 01, 2011 6:35 PM
To: spectrumanalyzer@yahoogroups.com
Subject: Re: [spectrumanalyzer] Re: USB Questions

Hi Fan,
Here is my understanding. There will be one USB board. It is already designed and in use for other projects. It has the standard USB input connector, and output pin connections.
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The software will have the provision to be "told" to use "USB Only" or "USB/Parallel".
The software is still in the beta test mode.
Scotty

--- On Tue, 2/1/11, b767_fan <b767_fan@...> wrote:

From: b767_fan <b767_fan@...>
Subject: [spectrumanalyzer] Re: USB Questions
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, February 1, 2011, 5:00 PM

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> > than the parallel port. I'll let Dave respond as to the details of the
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> > communication with the hardware. In VNA modes, the dominant timing factor
> > will generally be the amount of wait time needed to allow full settling.
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> > I don't know of anyone designing a direct control board replacement that
> > would contain the Cypress chip. For anyone who directly wires a Cypress
> > board to the modules, I did design a board that provides +10V and +23V
> > supplies--a similar concept to the Control Board but without the latches.
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> > with a Cypress board layout such as Dave Brainerd's.
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> > Sam W.
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> > --- In spectrumanalyzer@yahoogroups.com<spectrumanalyzer%40yahoogroups.com>,
> > "nealmartini" <nealmartini@> wrote:
> > >
> > > Sam, David, & Others USB Knowledgeables,

> > >
> > > I am trying to understand the documentation I find in the group files
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> > > 3. If you connect a CY68013A USB controller board to an existing Control
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> > > 4. I assume it is WIN7 compatible.
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> > > 5. Is someone designing a SLIM version of a USB board that can be used in
> > place of the current MSA Control Board.
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> > > Sorry for all the questions. Thanks in advance for your help on this.
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> > > Neal
> > >
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> --
> Jim G. Hontoria
>

7540. Re: USB Questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-02 00:56:20 UTC
From: Ron
Topic: 7416 Message: 7540

Yes I went a similar way. I built a Cypress board according to Dave's design and put it in a small plastic box with a USB connector one end and a short length of ribbon cable and a male DB25 on the other. This allows me to run either USB or parallel.

Ron, VK7ZRO.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> You can buy an assembled Cypress board on eBay. I bought one for about $30, though I have yet to do anything with it. You just need to connect the appropriate pins of the Cypress to a male parallel port connector, and plug that into the control board. I understand that the pin assignments are in Dave's documentation on this site, and that Jim has gotten his MSA to work using this approach. Operation of switches other than the RBW switch is not yet supported in USB, but hopefully will be soon.
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> Sam W.

7541. Re: [spectrumanalyzer] Re: USB Questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-02 01:14:29 UTC
From: Berndt Josef Wulf
Topic: 7416 Message: 7541

G'day Jim,

I've a spare EZ-USB PCB that could be used as the controller. Where do I find Dave's instructions?

73, Berndt
VK5ABN

On 02/02/11 Jim Hontoria wrote:
> > The board I bought in eBay was the EZ-USB FX2XLP. It has a 128 pin Cypress chip and more pins and functionality than required for the MSA as it stands today. It works well if set up following carefully Dave’s instructions. A hint: use individual connectors for each wire. This allows you to go from the control board to the USB board easily. I am currently running from the control board because of the lack of implementation of the P4 switches (except the RBW).
>
>
>
> Jim

7542. Zero-IF Spectrum Analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-02 10:21:40 UTC
From: hackurate24
Topic: 7542 Message: 7542

Hello all! First time poster!

I am an EE student studying the design of a zero IF spectrum analyzer.

All papers I've read so far talk about spectrum analyzer designs upconverting to a high IF frequency then downconverting. I know that the main problem for zero-IF spectrum analyzers is flicker noise. Assuming I don't care too much about the sensitivity of my spectrum analyzer, is there anything that is prohibiting me from actually using a DC IF frequency?

Thank you for your time!

7543. RE: [spectrumanalyzer] Zero-IF Spectrum Analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-02 10:58:16 UTC
From: Neil Douglas
Topic: 7542 Message: 7543

Yes it is possible.

The VNWA2 by DG8SAQ can be used to provide a simple SA function using a 'DC IF'

See :- http://www.sdr-kits.net <http://www.sdr-kits.net/> for further information.

Regards

NeilD

G4SHJ

From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of hackurate24
Sent: 02 February 2011 10:22
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Zero-IF Spectrum Analyzer

Hello all! First time poster!

I am an EE student studying the design of a zero IF spectrum analyzer.

All papers I've read so far talk about spectrum analyzer designs upconverting to a high IF frequency then downconverting. I know that the main problem for zero-IF spectrum analyzers is flicker noise. Assuming I don't care too much about the sensitivity of my spectrum analyzer, is there anything that is prohibiting me from actually using a DC IF frequency?

Thank you for your time!

7544. Re: [spectrumanalyzer] Zero-IF Spectrum Analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-02 10:59:49 UTC
From: Dan Andersson
Topic: 7542 Message: 7544

On Wednesday 02 February 2011 10:21:40 you wrote:
> Hello all! First time poster!
>
> I am an EE student studying the design of a zero IF spectrum analyzer.
>
> All papers I've read so far talk about spectrum analyzer designs
> upconverting to a high IF frequency then downconverting. I know that the
> main problem for zero-IF spectrum analyzers is flicker noise. Assuming I
> don't care too much about the sensitivity of my spectrum analyzer, is
> there anything that is prohibiting me from actually using a DC IF
> frequency?
>
> Thank you for your time!

A "Zero IF" SA? Sure, as long as you have a broadband frontend and a very(!) wide band A/D converter with more than 16 bit resolution (16 bits gives you 90-ish dynamic range).

You can deal with "known" and predictable spurs in your DSP bu tthe frontend A/D will be a hard ut to crack unless yo design a high speed D/A with any of the fastest FPGA's.

If you accept the Zero IF SA to be a "sampling" SA, you can sample around half of the D/A's banwidth but if you want a "normal" SA, you have to go down a bit.

But be aware - you really need a shitload of number crunching power - so forget any PIC's or Atmel's doing the DSP'ing for you...

Make a broadband front > get the fastest A/D available > get the fastest and mightiest DSP processor available > Make your own display, don't even think on the word "USB"...

When you are eady with all this, then you'll understand why we design SA's the way we do...

//Dan

7545. Re: [spectrumanalyzer] Zero-IF Spectrum Analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-02 11:07:17 UTC
From: Dan Andersson
Topic: 7542 Message: 7545

The VNWA2 is a 1 (one) IF design. The IF is below 30KHz as a standard sound cip (USB) is doing the work and the rest is done in the software.

//Dan, M0DFI

On Wednesday 02 February 2011 10:58:16 you wrote:
> Yes it is possible.
>
>
>
> The VNWA2 by DG8SAQ can be used to provide a simple SA function using a 'DC
> IF'
>
>
>
> See :- http://www.sdr-kits.net <http://www.sdr-kits.net/> for further
> information.
>
>
>
> Regards
>
>
>
> NeilD
>
> G4SHJ
>
>
>
>
>
>
>
> _____
>
> From: spectrumanalyzer@yahoogroups.com
> [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of hackurate24
> Sent: 02 February 2011 10:22
> To: spectrumanalyzer@yahoogroups.com
> Subject: [spectrumanalyzer] Zero-IF Spectrum Analyzer
>
>
>
>

>
> Hello all! First time poster!
>
> I am an EE student studying the design of a zero IF spectrum analyzer.
>
> All papers I've read so far talk about spectrum analyzer designs
> upconverting to a high IF frequency then downconverting. I know that the
> main problem for zero-IF spectrum analyzers is flicker noise. Assuming I
> don't care too much about the sensitivity of my spectrum analyzer, is there
> anything that is prohibiting me from actually using a DC IF frequency?
>
> Thank you for your time!

7546. Re: USB Questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-02 12:08:26 UTC
From: Sam
Topic: 7416 Message: 7546

USB Controller folder in the Files section.
Sam W.
--- In spectrumanalyzer@yahoogroups.com, Berndt Josef Wulf <wulf@...> wrote:
>
> G'day Jim,
>
> I've a spare EZ-USB PCB that could be used as the controller. Where do I find
> Dave's instructions?
>
> 73, Berndt
> VK5ABN
>
> On 02/02/11 Jim Hontoria wrote:
> > > The board I bought in eBay was the EZ-USB FX2XLP. It has a 128 pin Cypress
> chip and more pins and functionality than required for the MSA as it stands
> today. It works well if set up following carefully Daveâ□□s instructions. A
> hint: use individual connectors for each wire. This allows you to go from the
> control board to the USB board easily. I am currently running from the control
> board because of the lack of implementation of the P4 switches (except the
> RBW).
> >
> >
> >
> > Jim
>

7547. Re: Zero-IF Spectrum Analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-02 13:09:03 UTC
From: Sam
Topic: 7542 Message: 7547

Off the cuff, here are some thoughts:

For a 0Hz IF SA, you would generate exactly the signal you want to view, mix it as the LO with the input, and evaluate the DC result. However, the DC level will depend on the relative phase of the LO and input signal. To resolve this problem, you need to use an IQ approach where you mix the input with the LO in one mixer and with a 90-degree-shifted version of the LO in another mixer and evaluate both DC levels. There are ICs that handle the IQ mixing within certain frequency ranges, but I'm not sure how suitable they are for generating DC outputs.

You will get false signals if spurs or harmonics of your LO signal match the frequency of signals in the input. Even if your LO signal does not contain harmonics, they will effectively be generated in the mixer. The spur/harmonic problem will limit the dynamic range if the input contains significant signals in addition to the one you want to look at, but maybe it still leaves enough range for your purposes.

The harmonic problem also exists for up-converting SAs, but the harmonics are well above the desired input range so it is feasible to filter the troublemakers out of the input. Or, you can filter out the lower frequencies and purposely target the harmonics.

Also, if you want to cover a broad range such as 0-1 GHz, generation of the LO signal will require that you use a high frequency VCO, such as 1-2 GHz, and downconvert it. So using a 0 Hz IF may not save you as much trouble as you hoped.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "hackurate24" <hackurate24@...> wrote:
>
> Hello all! First time poster!
>
> I am an EE student studying the design of a zero IF spectrum analyzer.
>
> All papers I've read so far talk about spectrum analyzer designs upconverting to a high IF frequency then downconverting. I know that the main problem for zero-IF spectrum analyzers is flicker noise. Assuming I don't care too much about the sensitivity of my spectrum analyzer, is there anything that is prohibiting me from actually using a DC IF frequency?
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> Thank you for your time!
>

7548. Re: Directional Couplers

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-02 21:16:08 UTC
From: Geoff
Topic: 6702 Message: 7548

The coupler which has just arived from China (after China Post held up the delivery) matches the spec as well as Sam's but, this is where I show my lack of knowledge, what connections are used for it to be used as a bridge ??

Geoff

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> A directional coupler can make a simple bridge for the MSA in Reflection Mode. Some ZEDC-15-2B (1-1000 MHz) couplers are available on eBay, for $14.99, with free shipping:
>
> http://cgi.ebay.com/Mini-Circuits-Directional-Coupler-ZEDC-15-2B-1-1000MHz-/270648790996?pt=LH_DefaultDomain_0&hash=item3f03eccfd4
>
> These are Minicircuits devices packed in very small metal boxes with SMA connectors. I bought another type of MCL coupler and tested it; the results were disappointing and nowhere near MCL's datasheet graphs. But I bought a ZEDC-15-2B from this seller and tested its directivity, which matched the datasheet very well. The directivity ranges from near 70 dB at 1 MHz to 25 dB at 500 MHz and 18 dB at 1 GHz. 70 dB is phenomenal; 25 dB is good and 18 dB is very usable.
>
> For a general purpose bridge, at this size and cost the ZEDC is hard to beat.
>
> There are also other offerings on eBay for this coupler. One of them is priced over $300, which is completely insane, so be careful which one you sign up for.
>
> Sam W.
>

7549. Re: Directional Couplers

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-02 22:07:28 UTC
From: Sam
Topic: 6702 Message: 7549

The DC produces a signal at the "coupled port" that is a fraction of that running from the "In" to the "Out" port. For a bridge, you don't care about the forward signal; you want a sample of the reflection. Therefore, you connect the TG to Out, the DUT to In and the MSA input to Coupled. If the DC is a 20 dB coupler, the signal at the MSA input will then be 20 dB below the reflection traveling from the DUT back to the DC In port. (You don't care exactly what the fraction is; that is dealt with automatically in Reference or OSL calibration.)

For DUTs with both input and output, you terminate the output with 50 ohms. Or, if you have a Transmission/Reflection switch you can connect the DUT input to DC In, as above, and connect the DUT output to the switch's transmission input, and the DC coupled port to the switch's reflection input. The switch output goes to the MSA input. The switch can then select the DUT output to measure transmission or the DC Coupled port to measure reflection. That selection is done automatically in the beta software when you switch between Transmission and Reflection modes.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Geoff" <m0ore@...> wrote:
>
>
> The coupler which has just arived from China (after China Post held up the delivery) matches the spec as well as Sam's but, this is where I show my lack of knowledge, what connections are used for it to be used as a bridge ??
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>
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> > There are also other offerings on eBay for this coupler. One of them is priced over

$300, which is completely insane, so be careful which one you sign up for.
> >
> > Sam W.
> >
>

7550. Re: [spectrumanalyzer] Re: Directional Couplers

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-02 22:29:41 UTC
From: Geoff Moore
Topic: 6702 Message: 7550

Thanks Sam, it works a treat on my N2PK VNA, I will try on the MSA tomorrow as soon as I get back from the saltmine.

Geoff

7551. Re: Zero-IF Spectrum Analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-03 01:38:31 UTC
From: hackurate24
Topic: 7542 Message: 7551

Hello Dan,

I think I am misunderstanding some key fundamental. I am confused why an extremely fast A/D is needed. If my IF was say, 10 MHz, then I would need a sampling frequency of at least 20 MHz (as I understand the nyquist theorem). With that reasoning, my intuition tells me that a zero-IF or near-zero-IF can absolutely make due with a slow ADC.

--- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:
>
> On Wednesday 02 February 2011 10:21:40 you wrote:
> > Hello all! First time poster!
> >
> > I am an EE student studying the design of a zero IF spectrum analyzer.
> >
> > All papers I've read so far talk about spectrum analyzer designs
> > upconverting to a high IF frequency then downconverting. I know that the
> > main problem for zero-IF spectrum analyzers is flicker noise. Assuming I
> > don't care too much about the sensitivity of my spectrum analyzer, is
> > there anything that is prohibiting me from actually using a DC IF
> > frequency?
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> > Thank you for your time!
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>
> A "Zero IF" SA? Sure, as long as you have a broadband frontend and a very(!)
> wide band A/D converter with more than 16 bit resolution (16 bits gives you
> 90-ish dynamic range).
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> You can deal with "known" and predictable spurs in your DSP bu tthe frontend
> A/D will be a hard ut to crack unless yo design a high speed D/A with any of
> the fastest FPGA's.
>
> If you accept the Zero IF SA to be a "sampling" SA, you can sample around half
> of the D/A's banwidth but if you want a "normal" SA, you have to go down a
> bit.
>
> But be aware - you really need a shitload of number crunching power - so
> forget any PIC's or Atmel's doing the DSP'ing for you...
>
> Make a broadband front > get the fastest A/D available > get the fastest and
> mightiest DSP processor available > Make your own display, don't even think on
> the word "USB"...
>
> When you are eady with all this, then you'll understand why we design SA's the
> way we do...

```
>
> //Dan
>
```

7552. Re: [spectrumanalyzer] Re: Zero-IF Spectrum Analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-03 09:11:00 UTC
From: Dan Andersson
Topic: 7542 Message: 7552

When you call a design "Zero IF", I read it exactly for what you call it, no IF stage. The zero IF designs have just a filter and attenuators at the front end before the A/D. The A/D takes in the full bandwidth of the SA, not a 10MHZ fraction of the band as when you have a copule of IF stages and mixers.

The Zero IF SA have no mixers either.

But as you describe it here, you mean a standard SA with low frequency IF.

That's a different animal all together! Look up DG8SAQ and VNWA2.
It's a VNA design (with SA) baed around the low frequency concept you probably mean.

The VNWA2 use two DDS'es, set apart by a few KHz. The two DDS'es are there to make a 360 degree phase readout possible.

Now to Nyqvist. Sampling at double the frequency will theoretically mean you can measure with half the sampling ratye as your bandwidth maximum. Yes, but it's really not good enough except for repetitive signals. Look at the important word "Sampling". Compare this with a sampling oscilloscope. You read - 8GHz bandwidth, and then they hide "repetitive signals" in the small print.

Use Google to find the manual for the DS800 Oscilloscope from IBZ electronics. This is a cheap 8GHz sampling USB oscilloscope. When using presampling, you can measure 4GHz repetitive signals, not bad for 399 U$

So, watch your choice of words... Zero IF is not "near zero IF" unless you write so.

The big boys use YIG controlled oscilloscopes with both YIG oscillators as well as YIG filters for the rathere extreme prestanda they advertiose. Unfortunately - it comes with a price tag.

If you really want to do something regarding SA's. Build a FPGA based A/D and design a real "Zero IF" (or rather "No IF) SA around it.
Also, the use of DC can mean two things in this type of groups... DC as in Direct Current but also as Direct Conversion. A "No IF or Zero IF" Sa is a Direct Conversion design.

//Dan

On Thursday 03 February 2011 01:38:31 you wrote:
> Hello Dan,
>
> I think I am misunderstanding some key fundamental. I am confused why an
> extremely fast A/D is needed. If my IF was say, 10 MHz, then I would need
> a sampling frequency of at least 20 MHz (as I understand the nyquist
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> > When you are eady with all this, then you'll understand why we design
> > SA's the way we do...
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> > //Dan

7553. Re: Zero-IF Spectrum Analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-03 13:52:56 UTC
From: Sam
Topic: 7542 Message: 7553

Zero IF receivers (a/k/a direct conversion receivers) do use an IF, but it is at zero Hz. Low IF receivers use a positive IF. Either way, some down-conversion is done with an LO and mixer. That's the terminology used by the chip manufactures who make the ICs that do the conversion. I don't know what the terminology would be if you went directly to digital. Such a technique would indeed use "no IF", but the term "no IF" wouldn't necessarily imply digital.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:
>
>
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> IF stage. The zero IF designs have just a filter and attenuators at the front
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> But as you describe it here, you mean a standard SA with low frequency IF.
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> That's a different animal all together! Look up DG8SAQ and VNWA2.
> It's a VNA design (with SA) baed around the low frequency concept you
> probably mean.
>
> The VNWA2 use two DDS'es, set apart by a few KHz. The two DDS'es are there to
> make a 360 degree phase readout possible.
>
> Now to Nyqvist. Sampling at double the frequency will theoretically mean you
> can measure with half the sampling ratye as your bandwidth maximum. Yes, but
> it's really not good enough except for repetitive signals. Look at the
> important word "Sampling". Compare this with a sampling oscilloscope. You read
> - 8GHz bandwidth, and then they hide "repetitive signals" in the small print.
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> Use Google to find the manual for the DS800 Oscilloscope from IBZ electronics.
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> So, watch your choice of words... Zero IF is not "near zero IF" unless you
> write so.
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> The big boys use YIG controlled oscilloscopes with both YIG oscillators as
> well as YIG filters for the rathere extreme prestanda they advertiose.
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> If you really want to do something regarding SA's. Build a FPGA based A/D and
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> Also, the use of DC can mean two things in this type of groups... DC as in
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> On Thursday 03 February 2011 01:38:31 you wrote:
> > Hello Dan,
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> > theorem). With that reasoning, my intuition tells me that a zero-IF or
> > near-zero-IF can absolutely make due with a slow ADC.
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> > --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@> wrote:
> > > On Wednesday 02 February 2011 10:21:40 you wrote:
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> > > > Thank you for your time!
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> > > //Dan
>

7554. Re: Zero-IF Spectrum Analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-03 14:06:19 UTC
From: Sam
Topic: 7542 Message: 7554

I forgot to add that if you want to use a YIG to generate an LO signal for your SA, check out the Stellex control boards available on eBay. They usually come with a YIG somewhere in the 8-10 GHz range, and cost about $60. For another $50-75 you can buy a lower frequency YIG on eBay. Search for the web site of John Miles, who explains how to use the Stellex boards to run your YIG. You just have to connect the board to the parallel port and use either his software or that from National Semiconductor--it's all a matter of programming an LM2326 IC, just like the MSA uses.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
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> >
>

7555. Step recovery diode module

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-03 16:13:31 UTC
From: Jim Hontoria
Topic: 7555 Message: 7555

Scotty,
I would like to add the step recovery modules to the groupbuy board that I have underway.
Any updates or suggestions?
Jim G. Hontoria

Sent from my iPhone

7556. Re: [spectrumanalyzer] Step recovery diode module

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-03 18:05:50 UTC
From: william sprowls
Topic: 7555 Message: 7556

Hi Jim,
 I have not made any mods or changes to the Multiplier. I do want to, someday.The idea here is for this new SLIM to fully replace the PLO 2 without any other components. It would use the same multiplier design as a basis, but with the following additions:
1. Size would be 1.2 x 2.4 (2U). This would be the same size as the SLIM PLO2, which it would replace.
2. Add an on-board ceramic filter that will pass 1024 MHz. This would replace the 2 stage cavity filter.
3. Add post filter splitter and 2 ERA-33 amplifiers for two outputs.
Scotty

--- On Thu, 2/3/11, Jim Hontoria <jghalpha@gmail.com> wrote:

From: Jim Hontoria <jghalpha@...>
Subject: [spectrumanalyzer] Step recovery diode module
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Thursday, February 3, 2011, 10:13 AM

Scotty,

I would like to add the step recovery modules to the groupbuy board that I have underway. Any updates or suggestions?

Jim G. Hontoria

Sent from my iPhone

7557. Re: Step recovery diode module

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-03 18:26:27 UTC
From: Sam
Topic: 7555 Message: 7557

Jim,
Here's a suggestion, based on my experience playing with the SRD multiplier years ago. If you use a 6"-12" coax between the diode output and a high pass filter (designed to reflect the lower harmonics), and place a 0.5-5 pF piston capacitor shunt to ground at the filter input, tuning the capacitor has a dramatic impact on the output power at your desired frequency. I managed to get 10 dBm this way with no amplifier. (I used a different design than Scotty's, but my design was probably no better than his.) You can view this as tinkering with the phase of the reflection of the low harmonics. I prefer to view it as altering the shape of the diode pulse. For high harmonic numbers (like 16), the harmonic content of a pulse is extremely sensitive to the shape of the pulse until you get to a very narrow pulse width. A small change in shape can take you from high power to no power for a given harmonic. Somewhere, I have a document on the mathematics of that.

As I recall, Scotty did a similar thing, but took it out of his final circuit because people might not have the equipment to watch the effects of their tuning. But once you have the MSA, it's easy.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
>
> Scotty,
> I would like to add the step recovery modules to the groupbuy board that I have underway. Any updates or suggestions?
> Jim G. Hontoria
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> Sent from my iPhone
>

7558. Re: Zero-IF Spectrum Analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-03 21:00:03 UTC
From: hackurate24
Topic: 7542 Message: 7558

Ahh I apologize for my confusion. Thank you for pointing out my vague word choice.

I see that the VNAW2 uses a low frequency IF, but why not exactly an IF of 0 Hz? Besides flicker noise affecting my sensitivity, what is keeping me from using a 0 Hz IF? This would, in theory, eliminate image frequencies. Also, for the sake of simplicity, let's assume that my spectrum analyzer will analyze signals from 1 MHz to 100 MHz.

Also, I was always under the impression that 0 Hz meant direct current DC?

--- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:
>
>
> When you call a design "Zero IF", I read it exactly for what you call it, no
> IF stage. The zero IF designs have just a filter and attenuators at the front
> end before the A/D. The A/D takes in the full bandwidth of the SA, not a 10MHZ
> fraction of the band as when you have a copule of IF stages and mixers.
>
> The Zero IF SA have no mixers either.
>
> But as you describe it here, you mean a standard SA with low frequency IF.
>
> That's a different animal all together! Look up DG8SAQ and VNWA2.
> It's a VNA design (with SA) baed around the low frequency concept you
> probably mean.
>
> The VNWA2 use two DDS'es, set apart by a few KHz. The two DDS'es are there to
> make a 360 degree phase readout possible.
>
> Now to Nyqvist. Sampling at double the frequency will theoretically mean you
> can measure with half the sampling ratye as your bandwidth maximum. Yes, but
> it's really not good enough except for repetitive signals. Look at the
> important word "Sampling". Compare this with a sampling oscilloscope. You read
> - 8GHz bandwidth, and then they hide "repetitive signals" in the small print.
>
> Use Google to find the manual for the DS800 Oscilloscope from IBZ electronics.
> This is a cheap 8GHz sampling USB oscilloscope. When using presampling, you
> can measure 4GHz repetitive signals, not bad for 399 U$
>
> So, watch your choice of words... Zero IF is not "near zero IF" unless you
> write so.
>
> The big boys use YIG controlled oscilloscopes with both YIG oscillators as
> well as YIG filters for the rathere extreme prestanda they advertiose.
> Unfortunately - it comes with a price tag.
>
> If you really want to do something regarding SA's. Build a FPGA based A/D and

> design a real "Zero IF" (or rather "No IF) SA around it.
> Also, the use of DC can mean two things in this type of groups... DC as in
> Direct Current but also as Direct Conversion. A "No IF or Zero IF" Sa is a
> Direct Conversion design.
>
> //Dan
>
>
> On Thursday 03 February 2011 01:38:31 you wrote:
> > Hello Dan,
> >
> > I think I am misunderstanding some key fundamental. I am confused why an
> > extremely fast A/D is needed. If my IF was say, 10 MHz, then I would need
> > a sampling frequency of at least 20 MHz (as I understand the nyquist
> > theorem). With that reasoning, my intuition tells me that a zero-IF or
> > near-zero-IF can absolutely make due with a slow ADC.
> >
> > --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@> wrote:
> > > On Wednesday 02 February 2011 10:21:40 you wrote:
> > > > Hello all! First time poster!
> > > >
> > > > I am an EE student studying the design of a zero IF spectrum analyzer.
> > > >
> > > > All papers I've read so far talk about spectrum analyzer designs
> > > > upconverting to a high IF frequency then downconverting. I know that
> > > > the main problem for zero-IF spectrum analyzers is flicker noise.
> > > > Assuming I don't care too much about the sensitivity of my spectrum
> > > > analyzer, is there anything that is prohibiting me from actually using
> > > > a DC IF frequency?
> > > >
> > > > Thank you for your time!
> > >
> > > A "Zero IF" SA? Sure, as long as you have a broadband frontend and a
> > > very(!) wide band A/D converter with more than 16 bit resolution (16
> > > bits gives you 90-ish dynamic range).
> > >
> > > You can deal with "known" and predictable spurs in your DSP bu tthe
> > > frontend A/D will be a hard ut to crack unless yo design a high speed
> > > D/A with any of the fastest FPGA's.
> > >
> > > If you accept the Zero IF SA to be a "sampling" SA, you can sample around
> > > half of the D/A's banwidth but if you want a "normal" SA, you have to go
> > > down a bit.
> > >
> > > But be aware - you really need a shitload of number crunching power - so
> > > forget any PIC's or Atmel's doing the DSP'ing for you...
> > >
> > > Make a broadband front > get the fastest A/D available > get the fastest
> > > and mightiest DSP processor available > Make your own display, don't
> > > even think on the word "USB"...

> > >
> > > When you are eady with all this, then you'll understand why we design
> > > SA's the way we do...
> > >
> > > //Dan
>

7559. Re: Zero-IF Spectrum Analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-03 21:06:03 UTC
From: hackurate24
Topic: 7542 Message: 7559

Sam,

Is it necessary to "generate exactly the signal I want to view"? Say I want to analyze signals from 1 MHz-100 MHz. Wouldn't I just need an LO that sweeps from 1 MHz - 100 MHz? The mixer difference frequencies that match the input signal's frequencies would then all downconvert to 0 Hz IF.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Off the cuff, here are some thoughts:
>
> For a 0Hz IF SA, you would generate exactly the signal you want to view, mix it as the LO with the input, and evaluate the DC result. However, the DC level will depend on the relative phase of the LO and input signal. To resolve this problem, you need to use an IQ approach where you mix the input with the LO in one mixer and with a 90-degree-shifted version of the LO in another mixer and evaluate both DC levels. There are ICs that handle the IQ mixing within certain frequency ranges, but I'm not sure how suitable they are for generating DC outputs.
>
> You will get false signals if spurs or harmonics of your LO signal match the frequency of signals in the input. Even if your LO signal does not contain harmonics, they will effectively be generated in the mixer. The spur/harmonic problem will limit the dynamic range if the input contains significant signals in addition to the one you want to look at, but maybe it still leaves enough range for your purposes.
>
> The harmonic problem also exists for up-converting SAs, but the harmonics are well above the desired input range so it is feasible to filter the troublemakers out of the input. Or, you can filter out the lower frequencies and purposely target the harmonics.
>
> Also, if you want to cover a broad range such as 0-1 GHz, generation of the LO signal will require that you use a high frequency VCO, such as 1-2 GHz, and downconvert it. So using a 0 Hz IF may not save you as much trouble as you hoped.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "hackurate24" <hackurate24@> wrote:
> >
> > Hello all! First time poster!
> >
> > I am an EE student studying the design of a zero IF spectrum analyzer.
> >
> > All papers I've read so far talk about spectrum analyzer designs upconverting to a high IF frequency then downconverting. I know that the main problem for zero-IF spectrum analyzers is flicker noise. Assuming I don't care too much about the sensitivity of my spectrum analyzer, is there anything that is prohibiting me from actually using a DC IF

frequency?
> >
> > Thank you for your time!
> >
>

7560. Re: Zero-IF Spectrum Analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-03 22:50:11 UTC
From: Sam
Topic: 7542 Message: 7560

What you describe is what I meant. At any one instant, you are analyzing one frequency, which is what I meant by the signal you want to view. So you generate exactly that frequency for your LO. After you analyze that frequency, you move to the next, etc. The mixing process at each frequency produces the 0 Hz IF that indicates the strength of the input signal at that frequency. 0 Hz is direct current, though what you really get is some bandwidth around 0 Hz, with the negative frequencies effectively folding over on top of the positive frequencies. Having both the I and Q measurements lets you sort things out. If you want to have selectable bandwidths, I think you have to either have selectable filters, or use a wide filter and resolve things digitally with multiple I and Q measurements and FFT. Frankly, that's about all I know (or maybe more than I know) about the I/Q process.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "hackurate24" <hackurate24@...> wrote:
>
> Sam,
>
> Is it necessary to "generate exactly the signal I want to view"? Say I want to analyze signals from 1 MHz-100 MHz. Wouldn't I just need an LO that sweeps from 1 MHz - 100 MHz? The mixer difference frequencies that match the input signal's frequencies would then all downconvert to 0 Hz IF.
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> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > Also, if you want to cover a broad range such as 0-1 GHz, generation of the LO signal

will require that you use a high frequency VCO, such as 1-2 GHz, and downconvert it. So using a 0 Hz IF may not save you as much trouble as you hoped.
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> > Sam W.
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> > --- In spectrumanalyzer@yahoogroups.com, "hackurate24" <hackurate24@> wrote:
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> > >
> > > Thank you for your time!
> > >
> >
>

7561. Re: Zero-IF Spectrum Analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-03 23:18:19 UTC
From: Sam
Topic: 7542 Message: 7561

A VNA is simpler than an SA in one respect: images are not a major issue. The only signal in the VNA input is the test signal reflected by or transmitted by the DUT, unless there is a foreign signal coming in from an antenna being tested, for example. The only image problem presented by the test signal results from a spur that is separated from the main signal by exactly the right frequency difference. This makes it feasible to use an IF such as 30 kHz. In an SA, though, a 30 kHz IF would result in every input signal appearing twice, where the LO equals the signal frequency +/- 30 kHz. That is, unless you can filter one of those out, which is difficult for such a low IF value.

Therefore, a 30 kHz LO is very workable for a VNA, but not so much so for an SA. On the other hand, both the VNA and SA have the harmonic issue with a 0 Hz LO, in that input harmonics of the target frequency create false images. So, for the VNA, it makes sense to avoid the 0 Hz IF, since a low, non-zero IF can work fine.

The harmonic problem can be resolved by digital processing of the IF, however. See the N2PK VNA Yahoo group regarding CDS (correlated double sampling).

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "hackurate24" <hackurate24@...> wrote:
>
> Ahh I apologize for my confusion. Thank you for pointing out my vague word choice.
>
> I see that the VNAW2 uses a low frequency IF, but why not exactly an IF of 0 Hz? Besides flicker noise affecting my sensitivity, what is keeping me from using a 0 Hz IF? This would, in theory, eliminate image frequencies. Also, for the sake of simplicity, let's assume that my spectrum analyzer will analyze signals from 1 MHz to 100 MHz.
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> --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@> wrote:
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> > That's a different animal all together! Look up DG8SAQ and VNWA2.
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> > Now to Nyqvist. Sampling at double the frequency will theoretically mean you
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> > > > On Wednesday 02 February 2011 10:21:40 you wrote:
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> > > > But be aware - you really need a shitload of number crunching power - so
> > > > forget any PIC's or Atmel's doing the DSP'ing for you...
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> > > > Make a broadband front > get the fastest A/D available > get the fastest
> > > > and mightiest DSP processor available > Make your own display, don't
> > > > even think on the word "USB"...
> > > >
> > > > When you are eady with all this, then you'll understand why we design
> > > > SA's the way we do...
> > > >
> > > > //Dan
> >
>

7562. Re: [spectrumanalyzer] Re: Zero-IF Spectrum Analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-03 23:24:13 UTC
From: william sprowls
Topic: 7542 Message: 7562

Hackurate,
 This is my 2 cent's worth. What you are describing is called synchronous detection. It has been around since pre WW 2. It was used for detecting the modulation of a signal without converting the signal to an Intermediate Frequency. It still converts the input signal to "0" Hz, using a mixing process. It was never intended for SA use because as Sam states, a "same frequency" phase lock is necessary. It is simple for single frequencies or several that are close together. Say 5%. Exceedingly difficult for wide band (1-100 MHz), although possible.
 Read up by googling "synchronous detection'. I promise you, you will pull your hair out. After a few days you might say, "Gee, the MSA doesn't look so bad, after all."
Scotty (with grins)

--- On Thu, 2/3/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: Zero-IF Spectrum Analyzer
To: spectrumanalyzer@yahoogroups.com
Date: Thursday, February 3, 2011, 4:50 PM

What you describe is what I meant. At any one instant, you are analyzing one frequency, which is what I meant by the signal you want to view. So you generate exactly that frequency for your LO. After you analyze that frequency, you move to the next, etc. The mixing process at each frequency produces the 0 Hz IF that indicates the strength of the input signal at that frequency. 0 Hz is direct current, though what you really get is some bandwidth around 0 Hz, with the negative frequencies effectively folding over on top of the positive frequencies. Having both the I and Q measurements lets you sort things out. If you want to have selectable bandwidths, I think you have to either have selectable filters, or use a wide filter and resolve things digitally with multiple I and Q measurements and FFT. Frankly, that's about all I know (or maybe more than I know) about the I/Q process.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "hackurate24" <hackurate24@...> wrote:

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> Sam,

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> Is it necessary to "generate exactly the signal I want to view"? Say I want to analyze signals from 1 MHz-100 MHz. Wouldn't I just need an LO that sweeps from 1 MHz - 100 MHz? The mixer difference frequencies that match the input signal's frequencies would then all downconvert to 0 Hz IF.

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> > Off the cuff, here are some thoughts:

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> > Sam W.

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> > --- In spectrumanalyzer@yahoogroups.com, "hackurate24" <hackurate24@> wrote:

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> > > Hello all! First time poster!

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frequency?

> > >

> > > Thank you for your time!

> > >

> >

>

7563. RE: [spectrumanalyzer] Re: Zero-IF Spectrum Analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-03 23:26:47 UTC
From: Neil Douglas
Topic: 7542 Message: 7563

The VNWA and other SDR devices use the 16 to 24 bits of a PC sound card to perform the sampling. These cards have a capacitor on the input and also some filtering to remove 50 / 60Hz and harmonics power line noise. A low frequency IF of typically 10 - 30KHz is chosen, the PC software then applies the necessary offset corrections.

NeilD

G4SHJ

From: spectrumanalyzer@yahoogroups.com
[mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of hackurate24
Sent: 03 February 2011 21:00
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Re: Zero-IF Spectrum Analyzer

Ahh I apologize for my confusion. Thank you for pointing out my vague word choice.

I see that the VNAW2 uses a low frequency IF, but why not exactly an IF of 0 Hz? Besides flicker noise affecting my sensitivity, what is keeping me from using a 0 Hz IF? This would, in theory, eliminate image frequencies. Also, for the sake of simplicity, let's assume that my spectrum analyzer will analyze signals from 1 MHz to 100 MHz.

Also, I was always under the impression that 0 Hz meant direct current DC?

--- In spectrumanalyzer@yahoogroups.com
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> Use Google to find the manual for the DS800 Oscilloscope from IBZ
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and
> design a real "Zero IF" (or rather "No IF) SA around it.
> Also, the use of DC can mean two things in this type of groups... DC as in

> Direct Current but also as Direct Conversion. A "No IF or Zero IF" Sa is a

> Direct Conversion design.
>
> //Dan
>
>
> On Thursday 03 February 2011 01:38:31 you wrote:
> > Hello Dan,
> >
> > I think I am misunderstanding some key fundamental. I am confused why an
> > extremely fast A/D is needed. If my IF was say, 10 MHz, then I would
need
> > a sampling frequency of at least 20 MHz (as I understand the nyquist
> > theorem). With that reasoning, my intuition tells me that a zero-IF or

> > near-zero-IF can absolutely make due with a slow ADC.
> >
> > --- In spectrumanalyzer@yahoogroups.com
<mailto:spectrumanalyzer%40yahoogroups.com> , Dan Andersson <dan@> wrote:
> > > On Wednesday 02 February 2011 10:21:40 you wrote:
> > > > Hello all! First time poster!
> > > >
> > > > I am an EE student studying the design of a zero IF spectrum
analyzer.
> > > >
> > > > All papers I've read so far talk about spectrum analyzer designs
> > > > upconverting to a high IF frequency then downconverting. I know that
> > > > the main problem for zero-IF spectrum analyzers is flicker noise.
> > > > Assuming I don't care too much about the sensitivity of my spectrum
> > > > analyzer, is there anything that is prohibiting me from actually
using
> > > > a DC IF frequency?
> > > >
> > > > Thank you for your time!
> > >
> > > A "Zero IF" SA? Sure, as long as you have a broadband frontend and a
> > > very(!) wide band A/D converter with more than 16 bit resolution (16
> > > bits gives you 90-ish dynamic range).
> > >
> > > You can deal with "known" and predictable spurs in your DSP bu tthe
> > > frontend A/D will be a hard ut to crack unless yo design a high speed
> > > D/A with any of the fastest FPGA's.
> > >
> > > If you accept the Zero IF SA to be a "sampling" SA, you can sample
around
> > > half of the D/A's banwidth but if you want a "normal" SA, you have to
go
> > > down a bit.
> > >
> > > But be aware - you really need a shitload of number crunching power -
so
> > > forget any PIC's or Atmel's doing the DSP'ing for you...
> > >
> > > Make a broadband front > get the fastest A/D available > get the
fastest
> > > and mightiest DSP processor available > Make your own display, don't
> > > even think on the word "USB"...
> > >
> > > When you are eady with all this, then you'll understand why we design
> > > SA's the way we do...
> > >
> > > //Dan
>

7564. PLO2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-04 00:09:09 UTC
From: radiotalk@xtra.co.nz
Topic: 7564 Message: 7564

Have just completed the assembly of boards for the VNA & started testing. Many thanks for the great project info.
I'm using the compiled V115 windows software.
I have tested from j3 IFA 10.7MHz to ADC & all appears well, input dB/mag dB step ie increasing the input gives me an increase on the Screen display. But PLO2 does not appear to be commanded to 1024MHz & U2-2 is 0v. All my PLO's are the ADF4112. Have checked all volts etc & cabling. PLO1 will return to 1013.296MHz on sweep halt.

On the compiled version V115, there is no "Show Variables" under Menu->Options?
If I try to select "4112" for PLO2 under the Hardware setup & save the file, it always defaults back to "2326" on program startup?

Do I need to install the basic version to test further?

Any help appreciated.

Chris

7565. Re: [spectrumanalyzer] PLO2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-04 01:36:23 UTC
From: william sprowls
Topic: 7564 Message: 7565

Hi Chris,
 Ver 115 has a bug when using the ADF 4112. We are close to releasing Version 116 and the Beta version is in the Files section. I will compile it into a .tkn file and put it in the Files section for temporary utilization. Look for it in the next few hours.
Scotty

--- On Thu, 2/3/11, radiotalk@... <chris@...> wrote:

From: radiotalk@xtra.co.nz <chris@...>
Subject: [spectrumanalyzer] PLO2
To: spectrumanalyzer@yahoogroups.com
Date: Thursday, February 3, 2011, 6:09 PM

Have just completed the assembly of boards for the VNA & started testing. Many thanks for the great project info.

I'm using the compiled V115 windows software.

I have tested from j3 IFA 10.7MHz to ADC & all appears well, input dB/mag dB step ie increasing the input gives me an increase on the Screen display. But PLO2 does not appear to be commanded to 1024MHz & U2-2 is 0v. All my PLO's are the ADF4112. Have checked all volts etc & cabling. PLO1 will return to 1013.296MHz on sweep halt.

On the compiled version V115, there is no "Show Variables" under Menu->Options?

If I try to select "4112" for PLO2 under the Hardware setup & save the file, it always defaults back to "2326" on program startup?

Do I need to install the basic version to test further?

Any help appreciated.

Chris

7566. Re: PLO2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-04 02:06:58 UTC
From: wsprowls
Topic: 7564 Message: 7566

I have just uploaded into the Files Section:
spectrumanalyzer.tkn
Version 116 Beta, tokenized (compiled as stand-alone)
Scotty

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Chris,
> Â Ver 115 has a bug when using the ADF 4112. We are close to releasing Version 116 and the Beta version is in the Files section. I will compile it into a .tkn file and put it in the Files section for temporary utilization. Look for it in the next few hours.
> Scotty
>
> --- On Thu, 2/3/11, radiotalk@... <chris@...> wrote:
>
> From: radiotalk@... <chris@...>
> Subject: [spectrumanalyzer] PLO2
> To: spectrumanalyzer@yahoogroups.com
> Date: Thursday, February 3, 2011, 6:09 PM
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> Have just completed the assembly of boards for the VNA & started testing. Many thanks for the great project info.
>
> I'm using the compiled V115 windows software.
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> I have tested from j3 IFA 10.7MHz to ADC & all appears well, input dB/mag dB step ie increasing the input gives me an increase on the Screen display. But PLO2 does not appear to be commanded to 1024MHz & U2-2 is 0v. All my PLO's are the ADF4112. Have checked all volts etc & cabling. PLO1 will return to 1013.296MHz on sweep halt.

>
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> On the compiled version V115, there is no "Show Variables" under Menu->Options?
>
> If I try to select "4112" for PLO2 under the Hardware setup & save the file, it always defaults back to "2326" on program startup?
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>
> Do I need to install the basic version to test further?
>
>
>
> Any help appreciated.
>
>
>
> Chris
>

7567. Re: PLO2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-04 07:56:30 UTC
From: radiotalk@xtra.co.nz
Topic: 7564 Message: 7567

Thanks Scotty.

That V116 has certainly fixed those issues. My next issue is that the commanding appears intermittent, both PL02 & PLO1 will not always initialise unless I have an oscilloscope probe connected to the LE lines & force a "Restart" sweep.

If I recall correctly, someone else had this issue with another ADF chip series?? Was there any solution?

Thanks again for the quick compile.
Chris

--- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@...> wrote:
>
> I have just uploaded into the Files Section:
> spectrumanalyzer.tkn
> Version 116 Beta, tokenized (compiled as stand-alone)
> Scotty
>
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> >
> > Hi Chris,
> > Â Ver 115 has a bug when using the ADF 4112. We are close to releasing Version 116 and the Beta version is in the Files section. I will compile it into a .tkn file and put it in the Files section for temporary utilization. Look for it in the next few hours.
> > Scotty
> >
> > --- On Thu, 2/3/11, radiotalk@ <chris@> wrote:
> >
> > From: radiotalk@ <chris@>
> > Subject: [spectrumanalyzer] PLO2
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Thursday, February 3, 2011, 6:09 PM
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> > Have just completed the assembly of boards for the VNA & started testing. Many thanks for the great project info.
> >
> > I'm using the compiled V115 windows software.
> >
> > I have tested from j3 IFA 10.7MHz to ADC & all appears well, input dB/mag dB step ie increasing the input gives me an increase on the Screen display. But PLO2 does not appear to be commanded to 1024MHz & U2-2 is 0v. All my PLO's are the ADF4112. Have checked all volts etc & cabling. PLO1 will return to 1013.296MHz on sweep halt.
> >
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> > On the compiled version V115, there is no "Show Variables" under Menu->Options?
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> > If I try to select "4112" for PLO2 under the Hardware setup & save the file, it always defaults back to "2326" on program startup?
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> > Do I need to install the basic version to test further?
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> >
> >
> > Any help appreciated.
> >
> >
> >
> > Chris
> >
>

7568. Re: PLO2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-04 14:05:00 UTC
From: Sam
Topic: 7564 Message: 7568

See message 6959 and its thread. Some capacitance or resistance to load the line should do the trick. Presently, your scope probe is adding the capacitance.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "radiotalk@..." <chris@...> wrote:
>
> Thanks Scotty.
>
> That V116 has certainly fixed those issues. My next issue is that the commanding appears intermittent, both PL02 & PLO1 will not always initialise unless I have an oscilloscope probe connected to the LE lines & force a "Restart" sweep.
>
> If I recall correctly, someone else had this issue with another ADF chip series?? Was there any solution?
>
> Thanks again for the quick compile.
> Chris
>
> --- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@> wrote:
> >
> > I have just uploaded into the Files Section:
> > spectrumanalyzer.tkn
> > Version 116 Beta, tokenized (compiled as stand-alone)
> > Scotty
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > >
> > > Hi Chris,
> > > Â Ver 115 has a bug when using the ADF 4112. We are close to releasing Version 116 and the Beta version is in the Files section. I will compile it into a .tkn file and put it in the Files section for temporary utilization. Look for it in the next few hours.
> > > Scotty
> > >
> > > --- On Thu, 2/3/11, radiotalk@ <chris@> wrote:
> > >
> > > From: radiotalk@ <chris@>
> > > Subject: [spectrumanalyzer] PLO2
> > > To: spectrumanalyzer@yahoogroups.com
> > > Date: Thursday, February 3, 2011, 6:09 PM
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> > > Have just completed the assembly of boards for the VNA & started testing. Many thanks for the great project info.
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> > > I'm using the compiled V115 windows software.
> > >
> > > I have tested from j3 IFA 10.7MHz to ADC & all appears well, input dB/mag dB step ie increasing the input gives me an increase on the Screen display. But PLO2 does not appear to be commanded to 1024MHz & U2-2 is 0v. All my PLO's are the ADF4112. Have checked all volts etc & cabling. PLO1 will return to 1013.296MHz on sweep halt.
> > >
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> > > On the compiled version V115, there is no "Show Variables" under Menu->Options?
> > >
> > > If I try to select "4112" for PLO2 under the Hardware setup & save the file, it always defaults back to "2326" on program startup?
> > >
> > >
> > >
> > > Do I need to install the basic version to test further?
> > >
> > >
> > >
> > > Any help appreciated.
> > >
> > >
> > >
> > > Chris
> > >
> >
>

7569. Liberty Basic Purchase Problem

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-05 02:53:32 UTC
From: nealmartini
Topic: 7569 Message: 7569

All,

Three weeks ago I decided to break down and purchase Liberty Basic so I could try out the latest Beta upgrade for the MSA software. Before that I was just using the latest executable so I did not have to use the Liberty Basic program to compile.

I followed the links that come up when you try and start the Liberty Basic Trial Copy and went through the process of ordering Liberty Basic for $59 and added the option of a $10 CD version.

To date I have not received anything. The website said I would get an email telling me how to download Liberty Basic, but I never did. I thought maybe they were going to send the CD since I selected that option, but I never received anything.

I also called the telephone number listed in the pop up and was only able to leave messages. I did not receive any return calls. Incidentally, my credit card was charged with the $69 the day after I placed the order.

Does anyone know the person who supplies Liberty Basic? Has anyone been successful in ordering from the pop up that comes up when you start the trial version of Liberty Basic? Any other suggestions?

Help
Neal

7570. Re: [spectrumanalyzer] Liberty Basic Purchase Problem

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-05 05:38:54 UTC
From: william sprowls
Topic: 7569 Message: 7570

Hi Neal,
The owner of Liberty Basic is Carl Gunter (or Gunther). Normally, you would download the free version from their website and when they get a payment, they supply you with the Code Key. This Key just unlocks the same code into full use. I never messed with the CD. But, I'm guessing you would get it in the snail mail, along with the Code Key.
 I suggest you email their support address, and tell Carl you are unhappy.
BTW, the executable for the new Beta is in the Files Section of our Group.
Scotty

--- On Fri, 2/4/11, nealmartini <nealmartini@...> wrote:

From: nealmartini <nealmartini@...>
Subject: [spectrumanalyzer] Liberty Basic Purchase Problem
To: spectrumanalyzer@yahoogroups.com
Date: Friday, February 4, 2011, 8:53 PM

All,

Three weeks ago I decided to break down and purchase Liberty Basic so I could try out the latest Beta upgrade for the MSA software. Before that I was just using the latest executable so I did not have to use the Liberty Basic program to compile.

I followed the links that come up when you try and start the Liberty Basic Trial Copy and went through the process of ordering Liberty Basic for $59 and added the option of a $10 CD version.

To date I have not received anything. The website said I would get an email telling me how to download Liberty Basic, but I never did. I thought maybe they were going to send the CD since I selected that option, but I never received anything.

I also called the telephone number listed in the pop up and was only able to leave messages. I did not receive any return calls. Incidentally, my credit card was charged with the $69 the day after I placed the order.

Does anyone know the person who supplies Liberty Basic? Has anyone been successful in ordering from the pop up that comes up when you start the trial version of Liberty Basic? Any other suggestions?

Help

Neal

7571. Re: Liberty Basic Purchase Problem

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-05 12:43:04 UTC
From: Sam
Topic: 7569 Message: 7571

There is also an active Liberty Basic group on Yahoo; you could post a message there. In my experience, Carl has been good to deal with.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Neal,
> The owner of Liberty Basic is Carl Gunter (or Gunther). Normally, you would download the free version from their website and when they get a payment, they supply you with the Code Key. This Key just unlocks the same code into full use. I never messed with the CD. But, I'm guessing you would get it in the snail mail, along with the Code Key.
> Â I suggest you email their support address, and tell Carl you are unhappy.
> BTW, the executable for the new Beta is in the Files Section of our Group.
> Scotty
>
>
> --- On Fri, 2/4/11, nealmartini <nealmartini@...> wrote:
>
> From: nealmartini <nealmartini@...>
> Subject: [spectrumanalyzer] Liberty Basic Purchase Problem
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, February 4, 2011, 8:53 PM
>
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> All,
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> Three weeks ago I decided to break down and purchase Liberty Basic so I could try out the

latest Beta upgrade for the MSA software. Before that I was just using the latest executable so I did not have to use the Liberty Basic program to compile.
>
>
>
> I followed the links that come up when you try and start the Liberty Basic Trial Copy and went through the process of ordering Liberty Basic for $59 and added the option of a $10 CD version.
>
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>
> To date I have not received anything. The website said I would get an email telling me how to download Liberty Basic, but I never did. I thought maybe they were going to send the CD since I selected that option, but I never received anything.
>
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>
> I also called the telephone number listed in the pop up and was only able to leave messages. I did not receive any return calls. Incidentally, my credit card was charged with the $69 the day after I placed the order.
>
>
>
> Does anyone know the person who supplies Liberty Basic? Has anyone been successful in ordering from the pop up that comes up when you start the trial version of Liberty Basic? Any other suggestions?
>
>
>
> Help
>
> Neal
>

7572. Re: [spectrumanalyzer] High impedance bridge

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-05 16:46:10 UTC
From: Jim Hontoria
Topic: 7531 Message: 7572

Hi Sam,
In order to include them with the content description of the GroupBuy I don't have schematic files for the amplifilter and Hi-impedance bridge.

16 users (that includes you and me) have expressed interest, which is close to what I had anticipated.

Jim

On Sun, Jan 30, 2011 at 11:20 AM, Sam <swetterlin@...> wrote:

>
>
> I have been fascinated by op-amp based bridges, in part because they can
> perform nearly perfectly below some frequency (somewhere in the 10-50 MHz
> range) and can perform very well above that. One thing this lets you do is
> display return loss graphs using just a spectrum analyzer + tracking
> generator. In fact, you don't even need a tracking generator, if you have a
> noise generator or plain-old swept-frequency-generator. Or, with the
> MSA/VNA, scans can be made with referece calibration, much simpler than OSL.
>
> In some cases, it would be handy for the bridge to have a reference
> impedance different from 50 ohms. 75 ohms is an obvious possibility, but
> there are also situations where a much higher impedance would be
> appropriate. For example, you could get more accurate measurements of MCF
> filters by using higher impedances. Especially below 30 MHz, many circuits
> might have impedances much higher than 50 ohms. Likewise, there may be
> circumstances where it would be nice to have a very low impedance bridge.
>
> I have designed a bridge whose reference impedance can be changed simply.
> Different high impedances could be selected by changing a single resistor.
> This single resistor approach will work for 50 ohms and higher. Lower
> impedances require changing a couple of resistors. The idea of changing
> resistors probably only works if you do so only occasionally, or if you
> create some simple switching method or allow plug-in resistors. The latter
> approach would work, but the goal of "perfect performance" probably limits
> the frequency range to <10 MHz or so.
>
> I am interested in whether this sort of thing actually appeals to anybody.
> If so, this board could be added to Jim's board.
>
> Sam W.
>
>
>

--
Jim G. Hontoria

7573. MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-05 22:40:21 UTC
From: motorol9
Topic: 7573 Message: 7573

I downloaded the new V 116 tkn file and tried to run it without any hardware connected. I get an error message saying there is a divide by zero error. Does the new software need the hardware connected for it to run ?.
Thanks
Rex

Copy of part of the error log generated.

Error log timestamp Sunday 06/02/11 08:34:50

Runtime error: Division by zero

```
Error(Exception)>>defaultAction
Error(Exception)>>activateHandler: <anUndefinedObject>
Error(Exception)>>handle
Error(Exception)>>signal
Error class(Exception class)>>signal: <'Division by zero'>
BasicRunProgram(Object)>>error: <'Division by zero'>
BasicRunProgram(BasicProgram)>>terminateRun: <aZeroDivide>
[] in BasicProgram>>errorHandlerBlock
```

7574. Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-06 01:35:41 UTC
From: Sam
Topic: 7573 Message: 7574

It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@...> wrote:
>
> I downloaded the new V 116 tkn file and tried to run it without any hardware connected. I get an error message saying there is a divide by zero error. Does the new software need the hardware connected for it to run ?.
> Thanks
> Rex
>
> Copy of part of the error log generated.
>
> Error log timestamp Sunday 06/02/11 08:34:50
>
> Runtime error: Division by zero
>
> Error(Exception)>>defaultAction
> Error(Exception)>>activateHandler: <anUndefinedObject>
> Error(Exception)>>handle
> Error(Exception)>>signal
> Error class(Exception class)>>signal: <'Division by zero'>
> BasicRunProgram(Object)>>error: <'Division by zero'>
> BasicRunProgram(BasicProgram)>>terminateRun: <aZeroDivide>
> [] in BasicProgram>>errorHandlerBlock
>

7575. Board Group Buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-06 03:07:54 UTC
From: Jim Hontoria
Topic: 7575 Message: 7575
Attachments: 2 described; binary payloads are missing from this source WARC

Hi everyone:

Please see attached two documents: One of them contains a description of the February 2011 group buy (this very same), the other one has all the individual pcb and sch files. This group buy started as filter collection but by popular demand has grown t something larger. In summary what we have is a board consisting on the following:

2 each 5 pole filters

1 each 4 pole filter

1 each amplifilter

2 each ceramic filters

4 each lo/hi pass filters

1 step recovery diode board

1 each updated video filter switch board

1 each updated W1JGH power meter

1 each Hi-Impedance bridge

1 VGA board for log detector

1 High isolation SPDT

1 VHF Transmission/Reflection switch

1 AADE accessory board to measure SMDs

Some boards are entirely new, others are updates and a good number of them are experimental.

Read the attached documentation for further details and how to order.

(Sorry for the highlighting, I don't seem to be avble to get rid of it)

Jim W1JGH

7576. Re: [spectrumanalyzer] Re: Directional Couplers

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-06 03:32:45 UTC
From: R Wall
Topic: 6702 Message: 7576

Hi all,

Must be a few buyers for the ZEDC-15-2B-1 Directional Coupler. I note that the the price is now $19.99.

Roderick Wall, vk3yc.

> A directional coupler can make a simple bridge for the MSA in Reflection Mode. Some ZEDC-15-2B (1-1000 MHz) couplers are available on eBay, for $14.99, with free shipping:
>
> http://cgi.ebay.com/Mini-Circuits-Directional-Coupler-ZEDC-15-2B-1-1000MHz-/270648790996?pt=LH_DefaultDomain_0&hash=item3f03eccfd4

From: Geoff
Sent: Thursday, February 03, 2011 8:16 AM
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Re: Directional Couplers

The coupler which has just arived from China (after China Post held up the delivery) matches the spec as well as Sam's but, this is where I show my lack of knowledge, what connections are used for it to be used as a bridge ??

Geoff

--- In mailto:spectrumanalyzer%40yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> A directional coupler can make a simple bridge for the MSA in Reflection Mode. Some ZEDC-15-2B (1-1000 MHz) couplers are available on eBay, for $14.99, with free shipping:
>
> http://cgi.ebay.com/Mini-Circuits-Directional-Coupler-ZEDC-15-2B-1-1000MHz-/270648790996?pt=LH_DefaultDomain_0&hash=item3f03eccfd4
>
> These are Minicircuits devices packed in very small metal boxes with SMA connectors. I bought another type of MCL coupler and tested it; the results were disappointing and nowhere near MCL's datasheet graphs. But I bought a ZEDC-15-2B from this seller and tested its directivity, which matched the datasheet very well. The directivity ranges from near 70 dB at 1 MHz to 25 dB at 500 MHz and 18 dB at 1 GHz. 70 dB is phenomenal; 25 dB is good and 18 dB is very usable.
>
> For a general purpose bridge, at this size and cost the ZEDC is hard to beat.
>
> There are also other offerings on eBay for this coupler. One of them is priced over $300, which is completely insane, so be careful which one you sign up for.
>
> Sam W.
>

No virus found in this message.
Checked by AVG - www.avg.com
Version: 10.0.1204 / Virus Database: 1435/3418 - Release Date: 02/02/11

7577. Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-06 03:52:51 UTC
From: wsprowls
Topic: 7573 Message: 7577

Rex,
I didn't make this clear when I put the new version 116 "spectrumanalyzer.tkn" in the Files section. It just replaces the version 115 that is normally downloaded from the web page:
http://scottyspectrumanalyzer.com/msasetcal.html
All of the accessory files must be downloaded into a common folder, including either one of the "spectrumanalyzer.tkn". Delete the version 115 "spectrumanalyzer.tkn" from that common folder before downloading the new version 116 "spectrumanalyzer.tkn" from the Files section.
Did you get an error with the version 115 "spectrumanalyzer.tkn"? If it ran ok, then the new version 116 "spectrumanalyzer.tkn" should run ok.
Scotty

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:
> >
> > I downloaded the new V 116 tkn file and tried to run it without any hardware connected. I get an error message saying there is a divide by zero error. Does the new software need the hardware connected for it to run ?.
> > Thanks
> > Rex
> >
> > Copy of part of the error log generated.
> >
> > Error log timestamp Sunday 06/02/11 08:34:50
> >
> > Runtime error: Division by zero
> >
> > Error(Exception)>>defaultAction
> > Error(Exception)>>activateHandler: <anUndefinedObject>
> > Error(Exception)>>handle
> > Error(Exception)>>signal
> > Error class(Exception class)>>signal: <'Division by zero'>
> > BasicRunProgram(Object)>>error: <'Division by zero'>
> > BasicRunProgram(BasicProgram)>>terminateRun: <aZeroDivide>
> > [] in BasicProgram>>errorHandlerBlock
> >
>

7578. Re: Directional Couplers

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-06 12:51:26 UTC
From: w4yn
Topic: 6702 Message: 7578

You may also want to check out this directional coupler:
http://www.box73.de/catalog/product_info.php?cPath=112_113_132&products_id=1296&osCsid=6vf941uucs29lfmnhomshfssg6

Tim W4YN

--- In spectrumanalyzer@yahoogroups.com, "R Wall" <maillist@...> wrote:
>
> Hi all,
>
> Must be a few buyers for the ZEDC-15-2B-1 Directional Coupler. I note that the the price is now $19.99.
>
> Roderick Wall, vk3yc.
>
> > A directional coupler can make a simple bridge for the MSA in Reflection Mode. Some ZEDC-15-2B (1-1000 MHz) couplers are available on eBay, for $14.99, with free shipping:
> >
> > http://cgi.ebay.com/Mini-Circuits-Directional-Coupler-ZEDC-15-2B-1-1000MHz-/270648790996?pt=LH_DefaultDomain_0&hash=item3f03eccfd4
>
>
>
> From: Geoff
> Sent: Thursday, February 03, 2011 8:16 AM
> To: spectrumanalyzer@yahoogroups.com
> Subject: [spectrumanalyzer] Re: Directional Couplers
>
>
>
> The coupler which has just arived from China (after China Post held up the delivery) matches the spec as well as Sam's but, this is where I show my lack of knowledge, what connections are used for it to be used as a bridge ??
>
> Geoff
>
> --- In mailto:spectrumanalyzer%40yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > A directional coupler can make a simple bridge for the MSA in Reflection Mode. Some ZEDC-15-2B (1-1000 MHz) couplers are available on eBay, for $14.99, with free shipping:
> >
> > http://cgi.ebay.com/Mini-Circuits-Directional-Coupler-ZEDC-15-2B-1-1000MHz-/270648790996?pt=LH_DefaultDomain_0&hash=item3f03eccfd4
> >
> > These are Minicircuits devices packed in very small metal boxes with SMA connectors. I

bought another type of MCL coupler and tested it; the results were disappointing and nowhere near MCL's datasheet graphs. But I bought a ZEDC-15-2B from this seller and tested its directivity, which matched the datasheet very well. The directivity ranges from near 70 dB at 1 MHz to 25 dB at 500 MHz and 18 dB at 1 GHz. 70 dB is phenomenal; 25 dB is good and 18 dB is very usable.
> >
> > For a general purpose bridge, at this size and cost the ZEDC is hard to beat.
> >
> > There are also other offerings on eBay for this coupler. One of them is priced over $300, which is completely insane, so be careful which one you sign up for.
> >
> > Sam W.
> >
>
>
>
>
> ---
>
> No virus found in this message.
> Checked by AVG - www.avg.com
> Version: 10.0.1204 / Virus Database: 1435/3418 - Release Date: 02/02/11
>

7579. GBPPR MSA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-06 19:29:49 UTC
From: jghbeta
Topic: 7579 Message: 7579

I just run into the attached web site:

http://www.qsl.net/n9zia/spec/index.html

I guess that will save in software...

Jim

7580. Re: GBPPR MSA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-06 19:36:22 UTC
From: Greg Broburg
Topic: 7579 Message: 7580

And your point is??

Greg

On 2/6/2011 1:29 PM, jghbeta wrote:
>
> I just run into the attached web site:
>
> http://www.qsl.net/n9zia/spec/index.html
>
> I guess that will save in software...
>
> Jim
>

7581. Re: GBPPR MSA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-06 19:54:11 UTC
From: n6tdt
Topic: 7579 Message: 7581

I noticed that there are some of our own members listed among the links.
Neal Martini, Sam Wetterlin and Jim Lucas.

These 3 are the ones that I knew are members and there may be others.

It is great to see other sites giving credit to those that are well deserving.

Dan Ellis
N6TDT

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> I just run into the attached web site:
>
> http://www.qsl.net/n9zia/spec/index.html
>
> I guess that will save in software...
>
> Jim
>

7582. PDM testing using DDS1 and DDS3

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-06 20:11:46 UTC
From: davidhooau
Topic: 7582 Message: 7582

Folks,

Is it possible to test the PDM using only DDS1 and DDS3 (no mixers or PLOs)? I wondered if a similar trick using "DDS1 sweep" to test the RWB filters could be applied here.

If it is possible, could this configuration be used as a VNA for testing at IF2 frequencies?

Thanks,

davidh

7583. Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-06 20:55:32 UTC
From: motorol9
Topic: 7573 Message: 7583

hi Scotty/Sam

Version 115 runs normally. I renamed the V115 tkn file (spectrumanalyzer.tkn.old) then added the V116 file to the same directory as spectrumanalyzer.tkn. When running the program it comes up with the divide error. Swapping the 2 tkn files around by renaming them V115 runs normally again.

Rex

--- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@...> wrote:
>
> Rex,
> I didn't make this clear when I put the new version 116 "spectrumanalyzer.tkn" in the Files section. It just replaces the version 115 that is normally downloaded from the web page:
> http://scottyspectrumanalyzer.com/msasetcal.html
> All of the accessory files must be downloaded into a common folder, including either one of the "spectrumanalyzer.tkn". Delete the version 115 "spectrumanalyzer.tkn" from that common folder before downloading the new version 116 "spectrumanalyzer.tkn" from the Files section.
> Did you get an error with the version 115 "spectrumanalyzer.tkn"? If it ran ok, then the new version 116 "spectrumanalyzer.tkn" should run ok.
> Scotty
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:
> > >
> > > I downloaded the new V 116 tkn file and tried to run it without any hardware connected. I get an error message saying there is a divide by zero error. Does the new software need the hardware connected for it to run ?.
> > > Thanks
> > > Rex
> > >
> > > Copy of part of the error log generated.
> > >
> > > Error log timestamp Sunday 06/02/11 08:34:50
> > >
> > > Runtime error: Division by zero
> > >

```
> > > Error(Exception)>>defaultAction
> > > Error(Exception)>>activateHandler: <anUndefinedObject>
> > > Error(Exception)>>handle
> > > Error(Exception)>>signal
> > > Error class(Exception class)>>signal: <'Division by zero'>
> > > BasicRunProgram(Object)>>error: <'Division by zero'>
> > > BasicRunProgram(BasicProgram)>>terminateRun: <aZeroDivide>
> > > [] in BasicProgram>>errorHandlerBlock
> > >
> >
>
```

7584. Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-06 21:05:46 UTC
From: Sam
Topic: 7573 Message: 7584

I'm not sure why the two versions behave differently. Do you have any version of ntport.dll installed on your computer?
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@...> wrote:
>
> hi Scotty/Sam
>
> Version 115 runs normally. I renamed the V115 tkn file (spectrumanalyzer.tkn.old) then added the V116 file to the same directory as spectrumanalyzer.tkn. When running the program it comes up with the divide error. Swapping the 2 tkn files around by renaming them V115 runs normally again.
>
> Rex
>
>
>
> --- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@> wrote:
> >
> > Rex,
> > I didn't make this clear when I put the new version 116 "spectrumanalyzer.tkn" in the Files section. It just replaces the version 115 that is normally downloaded from the web page:
> > http://scottyspectrumanalyzer.com/msasetcal.html
> > All of the accessory files must be downloaded into a common folder, including either one of the "spectrumanalyzer.tkn". Delete the version 115 "spectrumanalyzer.tkn" from that common folder before downloading the new version 116 "spectrumanalyzer.tkn" from the Files section.
> > Did you get an error with the version 115 "spectrumanalyzer.tkn"? If it ran ok, then the new version 116 "spectrumanalyzer.tkn" should run ok.
> > Scotty
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:
> > > >
> > > > I downloaded the new V 116 tkn file and tried to run it without any hardware connected. I get an error message saying there is a divide by zero error. Does the new software need the hardware connected for it to run ?.

```
> > > > Thanks
> > > > Rex
> > > >
> > > > Copy of part of the error log generated.
> > > >
> > > > Error log timestamp Sunday 06/02/11 08:34:50
> > > >
> > > > Runtime error: Division by zero
> > > >
> > > > Error(Exception)>>defaultAction
> > > > Error(Exception)>>activateHandler: <anUndefinedObject>
> > > > Error(Exception)>>handle
> > > > Error(Exception)>>signal
> > > > Error class(Exception class)>>signal: <'Division by zero'>
> > > > BasicRunProgram(Object)>>error: <'Division by zero'>
> > > > BasicRunProgram(BasicProgram)>>terminateRun: <aZeroDivide>
> > > > [] in BasicProgram>>errorHandlerBlock
> > > >
> > >
> >
>
```

7585. Re: [spectrumanalyzer] Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-06 21:51:27 UTC
From: william sprowls
Topic: 7573 Message: 7585

Hi Rex,
It is possible the file got corrupted during your download from the Files page. Throw away the one you have and download it again. If it still burps, send your downloaded copy to me via regular e-mail as an attachment. I performed the process with my WinXP computer and had no difficulty.
  By the way. Look in your common folder for the file folder called MSA_Info. Perhaps it has a problem. Throw it in the trash or rename it. Then run your "spectrumanalyzer.exe again. It looks for this folder and if not found, it creates a new one.
Scotty

--- On Sun, 2/6/11, motorol9 <r.pearson@...> wrote:

From: motorol9 <r.pearson@...>
Subject: [spectrumanalyzer] Re: MSA V116 and divide by zero error
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, February 6, 2011, 2:55 PM

hi Scotty/Sam

Version 115 runs normally. I renamed the V115 tkn file (spectrumanalyzer.tkn.old) then added the V116 file to the same directory as spectrumanalyzer.tkn. When running the program it comes up with the divide error. Swapping the 2 tkn files around by renaming them V115 runs normally again.

Rex

--- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@...> wrote:

>

> Rex,

> I didn't make this clear when I put the new version 116 "spectrumanalyzer.tkn" in the Files section. It just replaces the version 115 that is normally downloaded from the web page:

> http://scottyspectrumanalyzer.com/msasetcal.html

> All of the accessory files must be downloaded into a common folder, including either one of the "spectrumanalyzer.tkn". Delete the version 115 "spectrumanalyzer.tkn" from that common folder before downloading the new version 116 "spectrumanalyzer.tkn" from the Files section.

> Did you get an error with the version 115 "spectrumanalyzer.tkn"? If it ran ok, then the new version 116 "spectrumanalyzer.tkn" should run ok.

> Scotty

>

> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:

> >

> > It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.

> > Sam W.

> >

> > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:

> > >

> > > I downloaded the new V 116 tkn file and tried to run it without any hardware connected. I get an error message saying there is a divide by zero error. Does the new software need the hardware connected for it to run ?.

> > > Thanks

> > > Rex

> > >

> > > Copy of part of the error log generated.

> > >

> > > Error log timestamp Sunday 06/02/11 08:34:50

> > >

> > > Runtime error: Division by zero

> > >

> > > Error(Exception)>>defaultAction

> > > Error(Exception)>>activateHandler: <anUndefinedObject>

> > > Error(Exception)>>handle

> > > Error(Exception)>>signal

> > > Error class(Exception class)>>signal: <'Division by zero'>

> > > BasicRunProgram(Object)>>error: <'Division by zero'>

> > > BasicRunProgram(BasicProgram)>>terminateRun: <aZeroDivide>

> > > [] in BasicProgram>>errorHandlerBlock

> > >

> >

>

7586. I have built some modules which is easier and inexpensive

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-07 09:22:24 UTC
From: taishan_ma
Topic: 7586 Message: 7586

hello,

I have built some modules which is easier and inexpensive. Hopefully it can work well.
http://www.qsl.net/bg6khc/

bg6khc

7587. Re: [spectrumanalyzer] Step recovery diode module

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-07 23:44:55 UTC
From: Jim Hontoria
Topic: 7555 Message: 7587

LlloIs
Lol
Jim G. Hontoria

Sent from my iPhone

On Feb 3, 2011, at 1:05 PM, william sprowls <wsprowls@...> wrote:

> h

7588. Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-08 01:01:40 UTC
From: motorol9
Topic: 7573 Message: 7588

Hi Sam

Yes version 2.8.1.14 in the redist directory of the spec ana software

Rex

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I'm not sure why the two versions behave differently. Do you have any version of ntport.dll installed on your computer?
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:
> >
> > hi Scotty/Sam
> >
> > Version 115 runs normally. I renamed the V115 tkn file (spectrumanalyzer.tkn.old) then added the V116 file to the same directory as spectrumanalyzer.tkn. When running the program it comes up with the divide error. Swapping the 2 tkn files around by renaming them V115 runs normally again.
> >
> > Rex
> >
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@> wrote:
> > >
> > > Rex,
> > > I didn't make this clear when I put the new version 116 "spectrumanalyzer.tkn" in the Files section. It just replaces the version 115 that is normally downloaded from the web page:
> > > http://scottyspectrumanalyzer.com/msasetcal.html
> > > All of the accessory files must be downloaded into a common folder, including either one of the "spectrumanalyzer.tkn". Delete the version 115 "spectrumanalyzer.tkn" from that common folder before downloading the new version 116 "spectrumanalyzer.tkn" from the Files section.
> > > Did you get an error with the version 115 "spectrumanalyzer.tkn"? If it ran ok, then the new version 116 "spectrumanalyzer.tkn" should run ok.
> > > Scotty
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >
> > > > It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.

> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:
> > > > >
> > > > > I downloaded the new V 116 tkn file and tried to run it without any hardware connected. I get an error message saying there is a divide by zero error. Does the new software need the hardware connected for it to run ?.
> > > > > Thanks
> > > > > Rex
> > > > > >
> > > > > Copy of part of the error log generated.
> > > > > >
> > > > > Error log timestamp Sunday 06/02/11 08:34:50
> > > > > >
> > > > > Runtime error: Division by zero
> > > > > >
> > > > > Error(Exception)>>defaultAction
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> > > > > Error(Exception)>>handle
> > > > > Error(Exception)>>signal
> > > > > Error class(Exception class)>>signal: <'Division by zero'>
> > > > > BasicRunProgram(Object)>>error: <'Division by zero'>
> > > > > BasicRunProgram(BasicProgram)>>terminateRun: <aZeroDivide>
> > > > > [] in BasicProgram>>errorHandlerBlock
> > > > > >
> > > > >
> > >
> >
>

7589. Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-08 01:07:10 UTC
From: motorol9
Topic: 7573 Message: 7589

Hi Scotty

You got it. I deleated the MSA.Info folder and reran the setup screen creating a new one and all functions correctly. As I have only got the base specan working there were only the filter bandwidths and the filter calibration files. Don't know if that helps with the problem.

Thanks

Rex

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Rex,
> It is possible the file got corrupted during your download from the Files page. Throw away the one you have and download it again. If it still burps, send your downloaded copy to me via regular e-mail as an attachment. I performed the process with my WinXP computer and had no difficulty.
> Â By the way. Look in your common folder for the file folder called MSA_Info.Â Perhaps it has a problem. Throw it in the trash or rename it. Then run your "spectrumanalyzer.exe again. It looks for this folder and if not found, it creates a new one.
> Scotty
>
> --- On Sun, 2/6/11, motorol9 <r.pearson@...> wrote:
>
> From: motorol9 <r.pearson@...>
> Subject: [spectrumanalyzer] Re: MSA V116 and divide by zero error
> To: spectrumanalyzer@yahoogroups.com
> Date: Sunday, February 6, 2011, 2:55 PM
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> hi Scotty/Sam
>
>
>
> Version 115 runs normally. I renamed the V115 tkn file (spectrumanalyzer.tkn.old) then added the V116 file to the same directory as spectrumanalyzer.tkn. When running the program it comes up with the divide error. Swapping the 2 tkn files around by renaming them V115 runs normally again.
>
>
>
> Rex
>
>
>
> --- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@> wrote:
>
> >
>
> > Rex,
>
> > I didn't make this clear when I put the new version 116 "spectrumanalyzer.tkn" in the Files section. It just replaces the version 115 that is normally downloaded from the web page:
>
> > http://scottyspectrumanalyzer.com/msasetcal.html
>
> > All of the accessory files must be downloaded into a common folder, including either one of the "spectrumanalyzer.tkn". Delete the version 115 "spectrumanalyzer.tkn" from that common folder before downloading the new version 116 "spectrumanalyzer.tkn" from the Files section.
>
> > Did you get an error with the version 115 "spectrumanalyzer.tkn"? If it ran ok, then the new version 116 "spectrumanalyzer.tkn" should run ok.
>
> > Scotty
>
> >
>
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
>
> > >
>
> > > It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.
>
> > > Sam W.
>

> > >
>
> > > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:
>
> > > >
>
> > > > I downloaded the new V 116 tkn file and tried to run it without any hardware connected. I get an error message saying there is a divide by zero error. Does the new software need the hardware connected for it to run ?.
>
> > > > Thanks
>
> > > > Rex
>
> > > >
>
> > > > Copy of part of the error log generated.
>
> > > >
>
> > > > Error log timestamp Sunday 06/02/11 08:34:50
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>
> > > > Runtime error: Division by zero
>
> > > >
>
> > > > Error(Exception)>>defaultAction
>
> > > > Error(Exception)>>activateHandler: <anUndefinedObject>
>
> > > > Error(Exception)>>handle
>
> > > > Error(Exception)>>signal
>
> > > > Error class(Exception class)>>signal: <'Division by zero'>
>
> > > > BasicRunProgram(Object)>>error: <'Division by zero'>
>
> > > > BasicRunProgram(BasicProgram)>>terminateRun: <aZeroDivide>
>
> > > > [] in BasicProgram>>errorHandlerBlock
>
> > > >
>
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> >
>

7590. Group Buy: The deadline nears

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-08 01:36:01 UTC
From: jghbeta
Topic: 7590 Message: 7590

I will be closing taking orders on Sunday, February 13.
Look for message 7575 "Board Group Buy" for details.
In addition to what is described there it will include a couple of additional boards. One of them has to do with something that Scotty and SamW have come up with. For now I'll say that it has to do with cleaning up the "zero response".
It is a great collection for the serious experimenter!

Jim W1JGH

7591. Re: [spectrumanalyzer] Group Buy: The deadline nears

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-08 02:38:11 UTC
From: Phil Sittner
Topic: 7590 Message: 7591

Jim-

Count me in for one set. I didn't note how or when you want payment-any method is fine.

Phil
kd6rm
----- Original Message -----
From: jghbeta
To: spectrumanalyzer@yahoogroups.com
Sent: Monday, February 07, 2011 5:36 PM
Subject: [spectrumanalyzer] Group Buy: The deadline nears

I will be closing taking orders on Sunday, February 13.
Look for message 7575 "Board Group Buy" for details.
In addition to what is described there it will include a couple of additional boards. One of them has to do with something that Scotty and SamW have come up with. For now I'll say that it has to do with cleaning up the "zero response".
It is a great collection for the serious experimenter!

Jim W1JGH

7592. Re: [spectrumanalyzer] Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-08 04:22:07 UTC
From: william sprowls
Topic: 7573 Message: 7592

Hi Rex,
 Do I understand that your error has gone away and your MSA is functioning now?
Scotty

--- On Mon, 2/7/11, motorol9 <r.pearson@internode.on.net> wrote:

From: motorol9 <r.pearson@...>
Subject: [spectrumanalyzer] Re: MSA V116 and divide by zero error
To: spectrumanalyzer@yahoogroups.com
Date: Monday, February 7, 2011, 7:07 PM

Hi Scotty

You got it. I deleated the MSA.Info folder and reran the setup screen creating a new one and all functions correctly. As I have only got the base specan working there were only the filter bandwidths and the filter calibration files. Don't know if that helps with the problem.

Thanks

Rex

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:

>

> Hi Rex,

> It is possible the file got corrupted during your download from the Files page. Throw away the one you have and download it again. If it still burps, send your downloaded copy to me via regular e-mail as an attachment. I performed the process with my WinXP computer and had no difficulty.

> Â By the way. Look in your common folder for the file folder called MSA_Info.Â Perhaps it has a problem. Throw it in the trash or rename it. Then run your "spectrumanalyzer.exe again. It looks for this folder and if not found, it creates a new one.

> Scotty

>

> --- On Sun, 2/6/11, motorol9 <r.pearson@...> wrote:

>

> From: motorol9 <r.pearson@...>

> Subject: [spectrumanalyzer] Re: MSA V116 and divide by zero error

> To: spectrumanalyzer@yahoogroups.com

> Date: Sunday, February 6, 2011, 2:55 PM

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> hi Scotty/Sam

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>

> Version 115 runs normally. I renamed the V115 tkn file (spectrumanalyzer.tkn.old) then added the V116 file to the same directory as spectrumanalyzer.tkn. When running the program it comes up with the divide error. Swapping the 2 tkn files around by renaming them V115 runs normally again.

>

>

>

> Rex

>

>

>

> --- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@> wrote:

>

> >

>

> > Rex,

>

> > I didn't make this clear when I put the new version 116 "spectrumanalyzer.tkn" in the Files section. It just replaces the version 115 that is normally downloaded from the web page:

>

> > http://scottyspectrumanalyzer.com/msasetcal.html

>

> > All of the accessory files must be downloaded into a common folder, including either one of the "spectrumanalyzer.tkn". Delete the version 115 "spectrumanalyzer.tkn" from that common folder before downloading the new version 116 "spectrumanalyzer.tkn" from the Files section.

>

> > Did you get an error with the version 115 "spectrumanalyzer.tkn"? If it ran ok, then the new version 116 "spectrumanalyzer.tkn" should run ok.

>

> > Scotty

>

> >

>

> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:

>

> > >

>

> > > It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.

>

> > > Sam W.

>

> > >

>

> > > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:

>

> > > >

>

> > > > I downloaded the new V 116 tkn file and tried to run it without any hardware connected. I get an error message saying there is a divide by zero error. Does the new software need the hardware connected for it to run ?.

>

> > > > Thanks

>

> > > > Rex

>

> > > >

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> > > > Copy of part of the error log generated.

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> > > > Error log timestamp Sunday 06/02/11 08:34:50

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> > > > Runtime error: Division by zero

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> > > > Error(Exception)>>defaultAction

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> > > > Error(Exception)>>activateHandler: <anUndefinedObject>

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> > > > Error(Exception)>>handle

>

> > > > Error(Exception)>>signal

>

> > > > Error class(Exception class)>>signal: <'Division by zero'>

>

> > > > BasicRunProgram(Object)>>error: <'Division by zero'>

>

> > > > BasicRunProgram(BasicProgram)>>terminateRun: <aZeroDivide>

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> > > > [] in BasicProgram>>errorHandlerBlock

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7593. Re: [spectrumanalyzer] Group Buy: The deadline nears

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-08 04:37:08 UTC
From: Jim Hontoria
Topic: 7590 Message: 7593

Hi Phil,

If you read to the end of the document, in its second page, there are
detailed instructions on how to do it.

Jim

On Mon, Feb 7, 2011 at 9:38 PM, Phil Sittner <sittners@...> wrote:

>
>
> Jim-
>
> Count me in for one set. I didn't note how or when you want payment-any
> method is fine.
>
> Phil
> kd6rm
>
> ----- Original Message -----
> *From:* jghbeta <jghalpha@...>
> *To:* spectrumanalyzer@yahoogroups.com
> *Sent:* Monday, February 07, 2011 5:36 PM
> *Subject:* [spectrumanalyzer] Group Buy: The deadline nears
>
>
>
> I will be closing taking orders on Sunday, February 13.
> Look for message 7575 "Board Group Buy" for details.
> In addition to what is described there it will include a couple of
> additional boards. One of them has to do with something that Scotty and SamW
> have come up with. For now I'll say that it has to do with cleaning up the
> "zero response".
> It is a great collection for the serious experimenter!
>
> Jim W1JGH
>
>
>

--
Jim G. Hontoria

7594. Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-08 07:33:40 UTC
From: motorol9
Topic: 7573 Message: 7594

Hi Scotty - SA is now working with V116

It appears there was some compatibility issue with the MSA.Info file between the two versions. I did a quick cal with the V116 software running then tried it with V115(g) software and it worked ok.
But when I used the old MSA.Info file V115(g) worked ok but V116 would not - just the div by zero error.

Rex

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Rex,
> Â Do I understand that your error has gone away and your MSA is functioning now?
> Scotty
>
> --- On Mon, 2/7/11, motorol9 <r.pearson@...> wrote:
>
> From: motorol9 <r.pearson@...>
> Subject: [spectrumanalyzer] Re: MSA V116 and divide by zero error
> To: spectrumanalyzer@yahoogroups.com
> Date: Monday, February 7, 2011, 7:07 PM
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> Hi Scotty
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>
> You got it. I deleated the MSA.Info folder and reran the setup screen creating a new one and all functions correctly. As I have only got the base specan working there were only the filter bandwidths and the filter calibration files. Don't

know if that helps with the problem.
>
>
>
> Thanks
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> Rex
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>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
>
> >
>
> > Hi Rex,
>
> > It is possible the file got corrupted during your download from the Files page. Throw away the one you have and download it again. If it still burps, send your downloaded copy to me via regular e-mail as an attachment. I performed the process with my WinXP computer and had no difficulty.
>
> > ÃÂ By the way. Look in your common folder for the file folder called MSA_Info.ÃÂ Perhaps it has a problem. Throw it in the trash or rename it. Then run your "spectrumanalyzer.exe again. It looks for this folder and if not found, it creates a new one.
>
> > Scotty
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>
> > --- On Sun, 2/6/11, motorol9 <r.pearson@> wrote:
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> > From: motorol9 <r.pearson@>
>
> > Subject: [spectrumanalyzer] Re: MSA V116 and divide by zero error
>
> > To: spectrumanalyzer@yahoogroups.com
>
> > Date: Sunday, February 6, 2011, 2:55 PM
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>
> > hi Scotty/Sam
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> > Version 115 runs normally. I renamed the V115 tkn file (spectrumanalyzer.tkn.old) then added the V116 file to the same directory as spectrumanalyzer.tkn. When running the program it comes up with the divide error. Swapping the 2 tkn files around by renaming them V115 runs normally again.
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> > Rex
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> > --- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@> wrote:
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> > > Rex,
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>
> > > I didn't make this clear when I put the new version 116 "spectrumanalyzer.tkn" in the Files section. It just replaces the version 115 that is normally downloaded from the web page:
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>
> > > http://scottyspectrumanalyzer.com/msasetcal.html
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>
> > > All of the accessory files must be downloaded into a common folder, including either one of the "spectrumanalyzer.tkn". Delete the version 115 "spectrumanalyzer.tkn" from that common folder before downloading the new version 116 "spectrumanalyzer.tkn" from the Files section.
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>
> > > Did you get an error with the version 115 "spectrumanalyzer.tkn"? If it ran ok, then the new version 116 "spectrumanalyzer.tkn" should run ok.
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> > > Scotty
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> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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>
> > > > It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.
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> > > > Sam W.
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> > > > > I downloaded the new V 116 tkn file and tried to run it without any hardware connected. I get an error message saying there is a divide by zero error. Does the new software need the hardware connected for it to run ?.
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> > > > > Thanks
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> > > > > Rex
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> > > > > Copy of part of the error log generated.
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> > > > > Error log timestamp Sunday 06/02/11 08:34:50
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> > > > > Runtime error: Division by zero
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> > > > > Error(Exception)>>defaultAction
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> > > > > Error(Exception)>>activateHandler: <anUndefinedObject>
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> > > > > Error(Exception)>>handle
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> > > > > Error(Exception)>>signal
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> > > > > BasicRunProgram(Object)>>error: <'Division by zero'>
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> > > > > BasicRunProgram(BasicProgram)>>terminateRun: <aZeroDivide>
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> > > > > [] in BasicProgram>>errorHandlerBlock
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7595. Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-08 14:31:16 UTC
From: Sam
Topic: 7573 Message: 7595

Rex,
The MSA_Info folder contains several files. The path calibration files are identical in the two versions, so you shouldn't have to replace those. There were some changes in the configuration and preference files, so the issue may be there. You might try running with the old MSA_Info, but with its preferences file (Prefs.txt) deleted. A new one will be created.

The other possibility is to run with the configuration file (config.txt) deleted. This will cause the Configuration Manager to run when you start up. You can then set the new configuration items (switches and video capacitors), and an up-to-date configuration file will be created. You'll also have to re-enter your RBW filter info and any other custom configuration info.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@...> wrote:
>
> Hi Scotty - SA is now working with V116
>
> It appears there was some compatibility issue with the MSA.Info file between the two versions. I did a quick cal with the V116 software running then tried it with V115(g) software and it worked ok.
> But when I used the old MSA.Info file V115(g) worked ok but V116 would not - just the div by zero error.
>
> Rex
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> >
> > Hi Rex,
> > Â Do I understand that your error has gone away and your MSA is functioning now?
> > Scotty
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> > --- On Mon, 2/7/11, motorol9 <r.pearson@> wrote:
> >
> > From: motorol9 <r.pearson@>
> > Subject: [spectrumanalyzer] Re: MSA V116 and divide by zero error
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Monday, February 7, 2011, 7:07 PM
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> > Hi Scotty
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> > You got it. I deleated the MSA.Info folder and reran the setup screen creating a new one and all functions correctly. As I have only got the base specan working there were only the filter bandwidths and the filter calibration files. Don't know if that helps with the problem.
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> > Thanks
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> > Rex
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> > > Hi Rex,
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> > > It is possible the file got corrupted during your download from the Files page. Throw away the one you have and download it again. If it still burps, send your downloaded copy to me via regular e-mail as an attachment. I performed the process with my WinXP computer and had no difficulty.
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> > > ÃÂ By the way. Look in your common folder for the file folder called MSA_Info.ÃÂ Perhaps it has a problem. Throw it in the trash or rename it. Then run your "spectrumanalyzer.exe again. It looks for this folder and if not found, it creates a new one.
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> > > Scotty
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> > > --- On Sun, 2/6/11, motorol9 <r.pearson@> wrote:
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> > > From: motorol9 <r.pearson@>
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> > > Subject: [spectrumanalyzer] Re: MSA V116 and divide by zero error
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> > > Version 115 runs normally. I renamed the V115 tkn file (spectrumanalyzer.tkn.old) then added the V116 file to the same directory as spectrumanalyzer.tkn. When running the program it comes up with the divide error. Swapping the 2 tkn files around by renaming them V115 runs normally again.
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> > > Rex
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> > > --- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@> wrote:
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> > > > Rex,
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> > > > I didn't make this clear when I put the new version 116 "spectrumanalyzer.tkn" in the Files section. It just replaces the version 115 that is normally downloaded from the web page:
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> > > > http://scottyspectrumanalyzer.com/msasetcal.html
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> >
> > > > All of the accessory files must be downloaded into a common folder, including either one of the "spectrumanalyzer.tkn". Delete the version 115 "spectrumanalyzer.tkn" from that common folder before downloading the new version 116 "spectrumanalyzer.tkn" from the Files section.
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> >
> > > > Did you get an error with the version 115 "spectrumanalyzer.tkn"? If it ran ok, then the new version 116 "spectrumanalyzer.tkn" should run ok.
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> > > > Scotty
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> > > > > It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.
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> > > > > > > Thanks
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> > > > > > Rex
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> > > > > > Copy of part of the error log generated.
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> > > > > > Error(Exception)>>activateHandler: <anUndefinedObject>
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7596. Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-08 17:29:35 UTC
From: wsprowls
Topic: 7573 Message: 7596

Rex,
I think I have an answer to your error. On my XP computer, Version 115 will open without ntport but will not be able to actually command the MSA Hardware. Version 116 will give a runtime error.
Even though you have the proper ntport files, they are not installed correctly. Do this:
After you have downloaded the "redist.zip" into the MSA folder, you must do the following:
1. Unzip it to create a folder called "redist"
2. Open the "redist" folder and find the file called NTPortDrvSetup.exe.
3. Double click it to run it. It will install the Ntport drivers into the correct system directories for your computer.
4. You may throw away the "redist.zip" folder and the "redist" folder. They are no longer needed (for that particular computer).

Scotty

--- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@...> wrote:
>
> Hi Sam
>
> Yes version 2.8.1.14 in the redist directory of the spec ana software
>
> Rex
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > I'm not sure why the two versions behave differently. Do you have any version of ntport.dll installed on your computer?
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:
> > >
> > > hi Scotty/Sam
> > >
> > > Version 115 runs normally. I renamed the V115 tkn file (spectrumanalyzer.tkn.old) then added the V116 file to the same directory as spectrumanalyzer.tkn. When running the program it comes up with the divide error. Swapping the 2 tkn files around by renaming them V115 runs normally again.
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> > > Rex
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> > > > Rex,

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> > > > http://scottyspectrumanalyzer.com/msasetcal.html
> > > > All of the accessory files must be downloaded into a common folder, including either one of the "spectrumanalyzer.tkn". Delete the version 115 "spectrumanalyzer.tkn" from that common folder before downloading the new version 116 "spectrumanalyzer.tkn" from the Files section.
> > > > Did you get an error with the version 115 "spectrumanalyzer.tkn"? If it ran ok, then the new version 116 "spectrumanalyzer.tkn" should run ok.
> > > > Scotty
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > >
> > > > > It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.
> > > > > Sam W.
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> > > > > > Copy of part of the error log generated.
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> > > > > > Error log timestamp Sunday 06/02/11 08:34:50
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> > > > > > Runtime error: Division by zero
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7597. Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-08 20:31:39 UTC
From: Sam
Topic: 7573 Message: 7597

Scotty,
Can you determine where the runtime error occurs by using the Debugger? Version 116, like 115, checks for ntport. If it is not present, no hardware operations should be attempted (unless via USB).

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@...> wrote:
>
> Rex,
> I think I have an answer to your error. On my XP computer, Version 115 will open without ntport but will not be able to actually command the MSA Hardware. Version 116 will give a runtime error.
> Even though you have the proper ntport files, they are not installed correctly. Do this:
> After you have downloaded the "redist.zip" into the MSA folder, you must do the following:
> 1. Unzip it to create a folder called "redist"
> 2. Open the "redist" folder and find the file called NTPortDrvSetup.exe.
> 3. Double click it to run it. It will install the Ntport drivers into the correct system directories for your computer.
> 4. You may throw away the "redist.zip" folder and the "redist" folder. They are no longer needed (for that particular computer).
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> --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:
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> > Yes version 2.8.1.14 in the redist directory of the spec ana software
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> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@> wrote:
> > > > >
> > > > > Rex,
> > > > > I didn't make this clear when I put the new version 116 "spectrumanalyzer.tkn" in the Files section. It just replaces the version 115 that is normally downloaded from the web page:
> > > > > http://scottyspectrumanalyzer.com/msasetcal.html
> > > > > All of the accessory files must be downloaded into a common folder, including either one of the "spectrumanalyzer.tkn". Delete the version 115 "spectrumanalyzer.tkn" from that common folder before downloading the new version 116 "spectrumanalyzer.tkn" from the Files section.
> > > > > Did you get an error with the version 115 "spectrumanalyzer.tkn"? If it ran ok, then the new version 116 "spectrumanalyzer.tkn" should run ok.
> > > > > Scotty
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > >
> > > > > > It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.
> > > > > > Sam W.
> > > > > >
> > > > > > --- In spectrumanalyzer@...m, "motorol9" <r.pearson@> wrote:
> > > > > > >
> > > > > > > I downloaded the new V 116 tkn file and tried to run it without any hardware connected. I get an error message saying there is a divide by zero error. Does the new software need the hardware connected for it to run ?.
> > > > > > > Thanks
> > > > > > > Rex
> > > > > > >
> > > > > > > Copy of part of the error log generated.
> > > > > > >
> > > > > > > Error log timestamp Sunday 06/02/11 08:34:50
> > > > > > >
> > > > > > > Runtime error: Division by zero
> > > > > > >
> > > > > > > Error(Exception)>>defaultAction
> > > > > > > Error(Exception)>>activateHandler: <anUndefinedObject>
> > > > > > > Error(Exception)>>handle
> > > > > > > Error(Exception)>>signal
> > > > > > > Error class(Exception class)>>signal: <'Division by zero'>
> > > > > > > BasicRunProgram(Object)>>error: <'Division by zero'>
> > > > > > > BasicRunProgram(BasicProgram)>>terminateRun: <aZeroDivide>

```
> > > > > > > [] in BasicProgram>>errorHandlerBlock
> > > > > > >
> > > > > >
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>
```

7598. Re: [spectrumanalyzer] Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-08 23:14:46 UTC
From: william sprowls
Topic: 7573 Message: 7598

Hi Sam,
I'm fixin to take Dad out for supper and a movie. I'll search for it when I get back tonight.
I was using spectrumanalyzer.exe and spectrumanalyzer.tkn. I created the error when I deleted the ntport and zntport from the system 32 folder. 116 did not get to the first window before crashing. 115 opened but of course, no commanding, thus, blank main window.
Scotty

--- On Tue, 2/8/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: MSA V116 and divide by zero error
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, February 8, 2011, 2:31 PM

Scotty,

Can you determine where the runtime error occurs by using the Debugger? Version 116, like 115, checks for ntport. If it is not present, no hardware operations should be attempted (unless via USB).

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@...> wrote:

>

> Rex,

> I think I have an answer to your error. On my XP computer, Version 115 will open without ntport but will not be able to actually command the MSA Hardware. Version 116 will give a runtime error.

> Even though you have the proper ntport files, they are not installed correctly. Do this:

> After you have downloaded the "redist.zip" into the MSA folder, you must do the following:

> 1. Unzip it to create a folder called "redist"

> 2. Open the "redist" folder and find the file called NTPortDrvSetup.exe.

> 3. Double click it to run it. It will install the Ntport drivers into the correct system directories for your computer.

> 4. You may throw away the "redist.zip" folder and the "redist" folder. They are no longer needed (for that particular computer).

>

> Scotty

>

> --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:

> >

> > Hi Sam

> >

> > Yes version 2.8.1.14 in the redist directory of the spec ana software

> >

> > Rex

> >

> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:

> > >

> > > I'm not sure why the two versions behave differently. Do you have any version of ntport.dll installed on your computer?

> > > Sam W.

> > >

> > > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:

> > > >

> > > > hi Scotty/Sam

> > > >

> > > > Version 115 runs normally. I renamed the V115 tkn file (spectrumanalyzer.tkn.old) then added the V116 file to the same directory as spectrumanalyzer.tkn. When running the program it comes up with the divide error. Swapping the 2 tkn files around by renaming them V115 runs normally again.

> > > >

> > > > Rex

> > > >

> > > >

> > > >

> > > > --- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@> wrote:

> > > > >

> > > > > Rex,

> > > > > I didn't make this clear when I put the new version 116 "spectrumanalyzer.tkn" in the Files section. It just replaces the version 115 that is normally downloaded from the web page:

> > > > > http://scottyspectrumanalyzer.com/msasetcal.html

> > > > > All of the accessory files must be downloaded into a common folder, including either one of the "spectrumanalyzer.tkn". Delete the version 115 "spectrumanalyzer.tkn" from that common folder before downloading the new version 116 "spectrumanalyzer.tkn" from the Files section.

> > > > > Did you get an error with the version 115 "spectrumanalyzer.tkn"? If it ran ok, then the new version 116 "spectrumanalyzer.tkn" should run ok.

> > > > > Scotty

> > > > >

> > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:

> > > > > >

> > > > > > It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.

> > > > > > Sam W.

> > > > > >

> > > > > > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:

> > > > > > >

> > > > > > > I downloaded the new V 116 tkn file and tried to run it without any hardware connected. I get an error message saying there is a divide by zero error. Does the new software need the hardware connected for it to run ?.

> > > > > > > Thanks

> > > > > > > Rex

> > > > > > >

> > > > > > > Copy of part of the error log generated.

> > > > > > >

> > > > > > > Error log timestamp Sunday 06/02/11 08:34:50

> > > > > > >

> > > > > > > Runtime error: Division by zero

```
> > > > > > >

> > > > > > > Error(Exception)>>defaultAction

> > > > > > > Error(Exception)>>activateHandler: <anUndefinedObject>

> > > > > > > Error(Exception)>>handle

> > > > > > > Error(Exception)>>signal

> > > > > > > Error class(Exception class)>>signal: <'Division by zero'>

> > > > > > > BasicRunProgram(Object)>>error: <'Division by zero'>

> > > > > > > BasicRunProgram(BasicProgram)>>terminateRun: <aZeroDivide>

> > > > > > > [] in BasicProgram>>errorHandlerBlock

> > > > > > >

> > > > > >

> > > > >

> > > >

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> >

>
```

7599. Re: [spectrumanalyzer] Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 01:39:41 UTC
From: william sprowls
Topic: 7573 Message: 7599

Hi Sam,
Here is where the bug occurs:

```
        'Initialize latching switches. moved here by ver116-4b so cb is valid.
    if cb=2 then    'SLIM ver116-1b
        'An initial low on the PS bit that controls latched switches may be draining switch
capacitors
        'Set it high and allow some recharge time
        out port, 128 'For SLIM latch 4 to set PS high.(Sam, It hangs up on this line)
        out control, STRB 'latch 128 into SLIM latch 4
    end if
```

Debug say it can't find the module
Scotty

--- On Tue, 2/8/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: MSA V116 and divide by zero error
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, February 8, 2011, 2:31 PM

Scotty,

Can you determine where the runtime error occurs by using the Debugger? Version 116, like 115, checks for ntport. If it is not present, no hardware operations should be attempted (unless via USB).

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@...> wrote:

>

> Rex,

> I think I have an answer to your error. On my XP computer, Version 115 will open without ntport but will not be able to actually command the MSA Hardware. Version 116 will give a runtime error.

> Even though you have the proper ntport files, they are not installed correctly. Do this:

> After you have downloaded the "redist.zip" into the MSA folder, you must do the following:

> 1. Unzip it to create a folder called "redist"

> 2. Open the "redist" folder and find the file called NTPortDrvSetup.exe.

> 3. Double click it to run it. It will install the Ntport drivers into the correct system directories for your computer.

> 4. You may throw away the "redist.zip" folder and the "redist" folder. They are no longer needed (for that particular computer).

>

> Scotty

>

> --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:

> >

> > Hi Sam

> >

> > Yes version 2.8.1.14 in the redist directory of the spec ana software

> >

> > Rex

> >

> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:

> > >

> > > I'm not sure why the two versions behave differently. Do you have any version of ntport.dll installed on your computer?

> > > Sam W.

> > >

> > > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:

> > > >

> > > > hi Scotty/Sam

> > > >

> > > > Version 115 runs normally. I renamed the V115 tkn file (spectrumanalyzer.tkn.old) then added the V116 file to the same directory as spectrumanalyzer.tkn. When running the program it comes up with the divide error. Swapping the 2 tkn files around by renaming them V115 runs normally again.

> > > >

> > > > Rex

> > > >

> > > >

> > > >

> > > > --- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@> wrote:

> > > > >

> > > > > Rex,

> > > > > I didn't make this clear when I put the new version 116 "spectrumanalyzer.tkn" in the Files section. It just replaces the version 115 that is normally downloaded from the web page:

> > > > > http://scottyspectrumanalyzer.com/msasetcal.html

> > > > > All of the accessory files must be downloaded into a common folder, including either one of the "spectrumanalyzer.tkn". Delete the version 115 "spectrumanalyzer.tkn" from that common folder before downloading the new version 116 "spectrumanalyzer.tkn" from the Files section.

> > > > > Did you get an error with the version 115 "spectrumanalyzer.tkn"? If it ran ok, then the new version 116 "spectrumanalyzer.tkn" should run ok.

> > > > > Scotty

> > > > >

> > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:

> > > > > >

> > > > > > It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.

> > > > > > Sam W.

> > > > > >

> > > > > > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:

> > > > > > >

> > > > > > > I downloaded the new V 116 tkn file and tried to run it without any hardware connected. I get an error message saying there is a divide by zero error. Does the new software need the hardware connected for it to run ?.

> > > > > > > Thanks

> > > > > > > Rex

> > > > > > >

> > > > > > > Copy of part of the error log generated.

```
> > > > > > >

> > > > > > > Error log timestamp Sunday 06/02/11 08:34:50

> > > > > > >

> > > > > > > Runtime error: Division by zero

> > > > > > >

> > > > > > > Error(Exception)>>defaultAction

> > > > > > > Error(Exception)>>activateHandler: <anUndefinedObject>

> > > > > > > Error(Exception)>>handle

> > > > > > > Error(Exception)>>signal

> > > > > > > Error class(Exception class)>>signal: <'Division by zero'>

> > > > > > > BasicRunProgram(Object)>>error: <'Division by zero'>

> > > > > > > BasicRunProgram(BasicProgram)>>terminateRun: <aZeroDivide>

> > > > > > > [] in BasicProgram>>errorHandlerBlock

> > > > > > >

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>
```

7600. Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 01:48:24 UTC
From: motorol9
Topic: 7573 Message: 7600

Hi Sam

Had to go back and recreate the files for V115 as I had deleted them.
It looks like it is the config file that caused the problem. If I left the V115 config file in the folder the div by 0 error came up when running V116. But if I deleted only the config file then ran V116 the config manager started and a new config file was created. There may be some compatibility issue with the additions that have been added to V116 config manager.

Thanks to you and Scotty for working this thru

Rex

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Rex,
> The MSA_Info folder contains several files. The path calibration files are identical in the two versions, so you shouldn't have to replace those. There were some changes in the configuration and preference files, so the issue may be there. You might try running with the old MSA_Info, but with its preferences file (Prefs.txt) deleted. A new one will be created.
>
> The other possibility is to run with the configuration file (config.txt) deleted. This will cause the Configuration Manager to run when you start up. You can then set the new configuration items (switches and video capacitors), and an up-to-date configuration file will be created. You'll also have to re-enter your RBW filter info and any other custom configuration info.
>
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:
> >
> > Hi Scotty - SA is now working with V116
> >
> > It appears there was some compatibility issue with the MSA.Info file between the two versions. I did a quick cal with the V116 software running then tried it with V115(g) software and it worked ok.
> > But when I used the old MSA.Info file V115(g) worked ok but V116 would not - just the div by zero error.
> >
> > Rex
> >
> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > >
> > > Hi Rex,
> > > Â Do I understand that your error has gone away and your MSA is functioning now?
> > > Scotty
> > >

> > > --- On Mon, 2/7/11, motorol9 <r.pearson@> wrote:
> > >
> > > From: motorol9 <r.pearson@>
> > > Subject: [spectrumanalyzer] Re: MSA V116 and divide by zero error
> > > To: spectrumanalyzer@yahoogroups.com
> > > Date: Monday, February 7, 2011, 7:07 PM
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> > >
> > > Hi Scotty
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> > >
> > > You got it. I deleated the MSA.Info folder and reran the setup screen creating a new one and all functions correctly. As I have only got the base specan working there were only the filter bandwidths and the filter calibration files. Don't know if that helps with the problem.
> > >
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> > >
> > > Thanks
> > >
> > >
> > >
> > > Rex
> > >
> > >
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > >
> > > >
> > >
> > > > Hi Rex,
> > >
> > > > It is possible the file got corrupted during your download from the Files page. Throw away the one you have and download it again. If it still burps, send your downloaded copy to me via regular e-mail as an attachment. I performed

the process with my WinXP computer and had no difficulty.
> > >
> > > > Ã□Â By the way. Look in your common folder for the file folder called MSA_Info.Ã□Â Perhaps it has a problem. Throw it in the trash or rename it. Then run your "spectrumanalyzer.exe again. It looks for this folder and if not found, it creates a new one.
> > >
> > > > Scotty
> > >
> > > >
> > >
> > > > --- On Sun, 2/6/11, motorol9 <r.pearson@> wrote:
> > >
> > > >
> > >
> > > > From: motorol9 <r.pearson@>
> > >
> > > > Subject: [spectrumanalyzer] Re: MSA V116 and divide by zero error
> > >
> > > > To: spectrumanalyzer@yahoogroups.com
> > >
> > > > Date: Sunday, February 6, 2011, 2:55 PM
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> > > > hi Scotty/Sam
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> > >
> > > > Version 115 runs normally. I renamed the V115 tkn file (spectrumanalyzer.tkn.old) then added the V116 file to the same directory as spectrumanalyzer.tkn. When running the program it comes up with the divide error. Swapping the 2 tkn files around by renaming them V115 runs normally again.
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> > > > Rex
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> > > > --- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@> wrote:
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> > > > > Rex,
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> > >
> > > > > I didn't make this clear when I put the new version 116 "spectrumanalyzer.tkn" in the Files section. It just replaces the version 115 that is normally downloaded from the web page:
> > >
> > > >
> > >

> > > > > http://scottyspectrumanalyzer.com/msasetcal.html
> > >
> > > >
> > >
> > > > > All of the accessory files must be downloaded into a common folder, including either one of the "spectrumanalyzer.tkn". Delete the version 115 "spectrumanalyzer.tkn" from that common folder before downloading the new version 116 "spectrumanalyzer.tkn" from the Files section.
> > >
> > > >
> > >
> > > > > Did you get an error with the version 115 "spectrumanalyzer.tkn"? If it ran ok, then the new version 116 "spectrumanalyzer.tkn" should run ok.
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> > >
> > > > > Scotty
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> > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > > >
> > >
> > > > > It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.
> > >
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> > >
> > > > > Sam W.
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> > > > > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:
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> > > > > > > I downloaded the new V 116 tkn file and tried to run it without any hardware connected. I get an error message saying there is a divide by zero error. Does the new software need the hardware connected for it to run ?.
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> > > > > > > Thanks
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> > > > > > > Rex
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> > > > > > > Copy of part of the error log generated.
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> > > > > > > Error log timestamp Sunday 06/02/11 08:34:50
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> > > > > > > Runtime error: Division by zero
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> > > > > > > Error(Exception)>>defaultAction
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> > > > > > > Error(Exception)>>activateHandler: <anUndefinedObject>
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> > > > > > > Error(Exception)>>handle
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> > > >
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> > > > > > > Error(Exception)>>signal
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> > > > > > > BasicRunProgram(Object)>>error: <'Division by zero'>
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> > > > > > > BasicRunProgram(BasicProgram)>>terminateRun: <aZeroDivide>
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> > > > > > > [] in BasicProgram>>errorHandlerBlock
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7601. Re: Group Buy: The deadline nears

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 07:51:37 UTC
From: taishan_ma
Topic: 7590 Message: 7601

Jim,

Sorry to bother you, could you please send the attachment zip file to me, I tried several times but can't download it, and don't know why.

thanks!

bg6khc

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> Hi Phil,
>
> If you read to the end of the document, in its second page, there are
> detailed instructions on how to do it.
>
> Jim
>
> On Mon, Feb 7, 2011 at 9:38 PM, Phil Sittner <sittners@...> wrote:
>
> >
> >
> > Jim-
> >
> > Count me in for one set. I didn't note how or when you want payment-any
> > method is fine.
> >
> > Phil
> > kd6rm
> >
> > ----- Original Message -----
> > *From:* jghbeta <jghalpha@...>
> > *To:* spectrumanalyzer@yahoogroups.com
> > *Sent:* Monday, February 07, 2011 5:36 PM
> > *Subject:* [spectrumanalyzer] Group Buy: The deadline nears
> >
> >
> >
> > I will be closing taking orders on Sunday, February 13.
> > Look for message 7575 "Board Group Buy" for details.
> > In addition to what is described there it will include a couple of
> > additional boards. One of them has to do with something that Scotty and SamW
> > have come up with. For now I'll say that it has to do with cleaning up the
> > "zero response".
> > It is a great collection for the serious experimenter!
> >

> > Jim W1JGH
> >
> >
> >
>
>
>
> --
> Jim G. Hontoria
>

7602. Re: [spectrumanalyzer] Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 10:26:34 UTC
From: SFC
Topic: 7573 Message: 7602

Hi,

While we are on the subject, I found some minor flaws I think:

```
[DDS3Track]'ver111-39d
'This uses DDS3 as a Tracking Generator, but is limited to 0 to 32 MHz, when MasterClock is
64 MHz
'DDS3 spare output is rich in harmonics and aliases.
'Tracks the values in Working Window, Center Frequency and Sweep Width (already in the
command arrays)
'The Spectrum Analyzer function is not effected.
'PLO3, Normal Tracking Generator, and Phase portion of VNA will be non-functional
-
-
-
if cb = 0 then gosub [CommandDDS3OrigCB]'will command DDS 3, only
'delver113-4a if cb = 2 then gosub [CommandDDS3SlimCB]'will command DDS 3, only
if cb = 2 then gosub [CommandAllSlims]'will command all 4 modules. ver113-4a
if cb = 3 then gosub [CommandAllSlimsUSB]'will command all 4 modules. ver113-4a
'USB:01-08-2010
> if cb = 3 then gosub [CommandAllSlimsUSB]'will command all 4 modules. ver113-4a
'USB:01-08-2010
wait
```

This line seems to belong to the routine below?

```
[DDS1Sweep]'ver112-2c
'This forces the DDS 1 to the values in Working Window: Center Frequency and Sweep Width
(already in the command arrays)
'DDS1 spare output is rich in harmonics and aliases.
'PLO1, and thus, the Spectrum Analyzer will be non-functional in this mode.
'Signal Generator or Tracking Generator output will not be effected.
-
-
-
-
if cb = 0 then gosub [CommandDDS1OrigCB]'will command DDS 1, only
'delver113-4a if cb = 2 then gosub [CommandDDS1SlimCB]'will command DDS 1, only
if cb = 2 then gosub [CommandAllSlims]'will command all 4 modules. ver113-4a
>

wait
```

Simon

7603. Filter plus GROUP BUY. An update.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 13:13:27 UTC
From: jghbeta
Topic: 7603 Message: 7603

New scoop:

By artfully rearranging the individual PCBs and a little increase in board size I have been able to add the diplexer PCB (by popular demand) and the "zero response zapper" by Scotty/SamW. Here is what Sam says about it:

quote
Scotty pointed out that the "zero response" that actually extends up to 1 MHz or so in VNA modes, can be significantly reduced by adding a buffer amplifier in the path from PLO2 to Mixer 3. This prevents LO3 from leaking back into PLO2. Essentially, this requires 15 dB of attenuation, followed by 18 dB of gain from an ERA-33 or similar MMIC, followed by 3 dB attenuation on the output. I made up the attached layout for such an amp, which is about 1.2" x 0.9" and is designed to be placed "in-line", with its connectors sticking out each end. That way it can be placed in the cabling from PLO2 to Mixer 3. I haven't done the schematic yet, but it is similar to the MMIC amp on the Signal Router board--but that one was a little more complex because it was also designed to provide power for other boards. This one can be built as normal MMIC-plus-inductor (the inductor actually fits on the R6 pad), or it can be an inductorless buffer amp such as the one I use on my TG output.
unquote

I might add: If you use a male SMA in one end you could connect directly to MXR3.

There is a great deal of interest in this board. So, those of you still on the fence, don't miss out!

Jim W1JGH

7604. Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 13:37:35 UTC
From: Sam
Topic: 7573 Message: 7604

I think this has to do with the old config file not having info on the video filter capacitors, so they end up as zero. I think I have now fixed that.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@...> wrote:
>
> Hi Sam
>
> Had to go back and recreate the files for V115 as I had deleted them.
> It looks like it is the config file that caused the problem. If I left the V115 config file in the folder the div by 0 error came up when running V116. But if I deleted only the config file then ran V116 the config manager started and a new config file was created.
> There may be some compatibility issue with the additions that have been added to V116 config manager.
>
> Thanks to you and Scotty for working this thru
>
> Rex
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Rex,
> > The MSA_Info folder contains several files. The path calibration files are identical in the two versions, so you shouldn't have to replace those. There were some changes in the configuration and preference files, so the issue may be there. You might try running with the old MSA_Info, but with its preferences file (Prefs.txt) deleted. A new one will be created.
> >
> > The other possibility is to run with the configuration file (config.txt) deleted. This will cause the Configuration Manager to run when you start up. You can then set the new configuration items (switches and video capacitors), and an up-to-date configuration file will be created. You'll also have to re-enter your RBW filter info and any other custom configuration info.
> >
> > Sam W.
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:
> > >
> > > Hi Scotty - SA is now working with V116
> > >
> > > It appears there was some compatibility issue with the MSA.Info file between the two versions. I did a quick cal with the V116 software running then tried it with V115(g) software and it worked ok.
> > > But when I used the old MSA.Info file V115(g) worked ok but V116 would not - just the div by zero error.
> > >
> > > Rex
> > >

> > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > > >
> > > > Hi Rex,
> > > > Â Do I understand that your error has gone away and your MSA is functioning now?
> > > > Scotty
> > > >
> > > > --- On Mon, 2/7/11, motorol9 <r.pearson@> wrote:
> > > >
> > > > From: motorol9 <r.pearson@>
> > > > Subject: [spectrumanalyzer] Re: MSA V116 and divide by zero error
> > > > To: spectrumanalyzer@yahoogroups.com
> > > > Date: Monday, February 7, 2011, 7:07 PM
> > > >
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> > > >
> > > > Hi Scotty
> > > >
> > > >
> > > >
> > > > You got it. I deleated the MSA.Info folder and reran the setup screen creating a new one and all functions correctly. As I have only got the base specan working there were only the filter bandwidths and the filter calibration files. Don't know if that helps with the problem.
> > > >
> > > >
> > > >
> > > > Thanks
> > > >
> > > >
> > > >
> > > > Rex
> > > >
> > > >
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > > >

> > > > >
> > > >
> > > > > Hi Rex,
> > > >
> > > > > It is possible the file got corrupted during your download from the Files page. Throw away the one you have and download it again. If it still burps, send your downloaded copy to me via regular e-mail as an attachment. I performed the process with my WinXP computer and had no difficulty.
> > > >
> > > > > ÃÂ By the way. Look in your common folder for the file folder called MSA_Info.ÃÂ Perhaps it has a problem. Throw it in the trash or rename it. Then run your "spectrumanalyzer.exe again. It looks for this folder and if not found, it creates a new one.
> > > >
> > > > > Scotty
> > > >
> > > > >
> > > >
> > > > > --- On Sun, 2/6/11, motorol9 <r.pearson@> wrote:
> > > >
> > > > >
> > > >
> > > > > From: motorol9 <r.pearson@>
> > > >
> > > > > Subject: [spectrumanalyzer] Re: MSA V116 and divide by zero error
> > > >
> > > > > To: spectrumanalyzer@yahoogroups.com
> > > >
> > > > > Date: Sunday, February 6, 2011, 2:55 PM
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> > > >
> > > > > hi Scotty/Sam
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> > > >
> > > > > Version 115 runs normally. I renamed the V115 tkn file (spectrumanalyzer.tkn.old) then added the V116 file to the same directory as spectrumanalyzer.tkn. When running the program it comes up with the divide error. Swapping the 2 tkn files around by renaming them V115 runs normally again.
> > > >
> > > > >
> > > >
> > > > >
> > > >
> > > > >
> > > >
> > > > > Rex
> > > >
> > > > >
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> > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@> wrote:
> > > >
> > > > >
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> > > > > >
> > > >
> > > > >
> > > >
> > > > > > Rex,
> > > >

> > > > >
> > > >
> > > > > > I didn't make this clear when I put the new version 116 "spectrumanalyzer.tkn" in the Files section. It just replaces the version 115 that is normally downloaded from the web page:
> > > >
> > > > >
> > > >
> > > > > > http://scottyspectrumanalyzer.com/msasetcal.html
> > > >
> > > > >
> > > >
> > > > > > All of the accessory files must be downloaded into a common folder, including either one of the "spectrumanalyzer.tkn". Delete the version 115 "spectrumanalyzer.tkn" from that common folder before downloading the new version 116 "spectrumanalyzer.tkn" from the Files section.
> > > >
> > > > >
> > > >
> > > > > > Did you get an error with the version 115 "spectrumanalyzer.tkn"? If it ran ok, then the new version 116 "spectrumanalyzer.tkn" should run ok.
> > > >
> > > > >
> > > >
> > > > > > Scotty
> > > >
> > > > >
> > > >
> > > > > >
> > > >
> > > > >
> > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >
> > > > >
> > > >
> > > > > >
> > > >
> > > > >
> > > >
> > > > > > It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.
> > > >
> > > > >
> > > >
> > > > > > Sam W.
> > > >
> > > > >
> > > >
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> > > > > > > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:
> > > >
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> > > >
> > > > > > > > I downloaded the new V 116 tkn file and tried to run it without any hardware connected. I get an error message saying there is a divide by zero error. Does the new software need the hardware connected for it to run ?.
> > > >
> > > > >
> > > >
> > > > > > > > Thanks
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> > > > > > > > Rex
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> > > > > > > > Copy of part of the error log generated.
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> > > > > > > > Error log timestamp Sunday 06/02/11 08:34:50
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> > > > > > > > Runtime error: Division by zero
> > > >
> > > > >
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> > > > >
> > > >
> > > > > > > > Error(Exception)>>defaultAction
> > > >
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> > > >
> > > > > > > > Error(Exception)>>activateHandler: <anUndefinedObject>
> > > >
> > > > >
> > > >
> > > > > > > > Error(Exception)>>handle
> > > >
> > > > >
> > > >
> > > > > > > > Error(Exception)>>signal
> > > >
> > > > >
> > > >
> > > > > > > > Error class(Exception class)>>signal: <'Division by zero'>
> > > >
> > > > >
> > > >
> > > > > > > > BasicRunProgram(Object)>>error: <'Division by zero'>
> > > >
> > > > >
> > > >
> > > > > > > > BasicRunProgram(BasicProgram)>>terminateRun: <aZeroDivide>
> > > >
> > > > >
> > > >
> > > > > > > > [] in BasicProgram>>errorHandlerBlock
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>

7605. Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 13:41:21 UTC
From: Sam
Topic: 7573 Message: 7605

Scotty,
Thanks for locating that. That initialization is supposed to be skipped if ntport is not present, so I have changed "If cb=2 then" to "If cb=2 and suppressHardware=0 then"

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Sam,
> Here is where the bug occurs:
>
> Â Â Â Â Â Â Â 'Initialize latching switches. moved here by ver116-4b so cb is valid.
> Â Â Â if cb=2 thenÂ Â Â 'SLIM ver116-1b
> Â Â Â Â Â Â Â 'An initial low on the PS bit that controls latched switches may be draining switch capacitors
> Â Â Â Â Â Â Â 'Set it high and allow some recharge time
> Â Â Â Â Â Â Â out port, 128 'For SLIM latch 4 to set PS high.(Sam, It hangs up on this line)
> Â Â Â Â Â Â Â out control, STRB 'latch 128 into SLIM latch 4
> Â Â Â end if
>
> Debug say it can't find the module
> Scotty
>
>
> --- On Tue, 2/8/11, Sam <swetterlin@...> wrote:
>
> From: Sam <swetterlin@...>
> Subject: [spectrumanalyzer] Re: MSA V116 and divide by zero error
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, February 8, 2011, 2:31 PM
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>
> Scotty,
>
> Can you determine where the runtime error occurs by using the Debugger? Version 116, like 115, checks for ntport. If it is not present, no hardware operations should be attempted (unless via USB).
>
>
>
> Sam W.
>
>
>
> --- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@> wrote:
>
> >
>
> > Rex,
>
> > I think I have an answer to your error. On my XP computer, Version 115 will open without ntport but will not be able to actually command the MSA Hardware. Version 116 will give a runtime error.
>
> > Even though you have the proper ntport files, they are not installed correctly. Do this:
>
> > After you have downloaded the "redist.zip" into the MSA folder, you must do the following:
>
> > 1. Unzip it to create a folder called "redist"
>
> > 2. Open the "redist" folder and find the file called NTPortDrvSetup.exe.
>
> > 3. Double click it to run it. It will install the Ntport drivers into the correct system directories for your computer.
>
> > 4. You may throw away the "redist.zip" folder and the "redist" folder. They are no longer needed (for that particular computer).
>
> >
>
> > Scotty
>
> >
>
> > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:
>
> > >

>
> > > Hi Sam
>
> > >
>
> > > Yes version 2.8.1.14 in the redist directory of the spec ana software
>
> > >
>
> > > Rex
>
> > >
>
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
>
> > > >
>
> > > > I'm not sure why the two versions behave differently. Do you have any version of ntport.dll installed on your computer?
>
> > > > Sam W.
>
> > > >
>
> > > > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:
>
> > > > >
>
> > > > > hi Scotty/Sam
>
> > > > >
>
> > > > > Version 115 runs normally. I renamed the V115 tkn file (spectrumanalyzer.tkn.old) then added the V116 file to the same directory as spectrumanalyzer.tkn. When running the program it comes up with the divide error. Swapping the 2 tkn files around by renaming them V115 runs normally again.
>
> > > > >
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> > > > > Rex
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> > > > >
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>
> > > > > --- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@> wrote:
>
> > > > > >

>
> > > > > > Rex,
>
> > > > > > I didn't make this clear when I put the new version 116 "spectrumanalyzer.tkn" in the Files section. It just replaces the version 115 that is normally downloaded from the web page:
>
> > > > > > http://scottyspectrumanalyzer.com/msasetcal.html
>
> > > > > > All of the accessory files must be downloaded into a common folder, including either one of the "spectrumanalyzer.tkn". Delete the version 115 "spectrumanalyzer.tkn" from that common folder before downloading the new version 116 "spectrumanalyzer.tkn" from the Files section.
>
> > > > > > Did you get an error with the version 115 "spectrumanalyzer.tkn"? If it ran ok, then the new version 116 "spectrumanalyzer.tkn" should run ok.
>
> > > > > > Scotty
>
> > > > > >
>
> > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
>
> > > > > > >
>
> > > > > > > It should run with no hardware. Did you do anything, or did it just start up and crash? Unfortunately, the Liberty Basic error log file never provides useful information. Do you have LB, so you can run it under the Debugger? That would tell you exactly where it crashed.
>
> > > > > > > Sam W.
>
> > > > > > >
>
> > > > > > > --- In spectrumanalyzer@yahoogroups.com, "motorol9" <r.pearson@> wrote:
>
> > > > > > > >
>
> > > > > > > > I downloaded the new V 116 tkn file and tried to run it without any hardware connected. I get an error message saying there is a divide by zero error. Does the new software need the hardware connected for it to run ?.
>
> > > > > > > > Thanks
>
> > > > > > > > Rex
>
> > > > > > > >
>
> > > > > > > > Copy of part of the error log generated.
>

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> > > > > > > >
>
> > > > > > > > Error log timestamp Sunday 06/02/11 08:34:50
>
> > > > > > > >
>
> > > > > > > > Runtime error: Division by zero
>
> > > > > > > >
>
> > > > > > > > Error(Exception)>>defaultAction
>
> > > > > > > > Error(Exception)>>activateHandler: <anUndefinedObject>
>
> > > > > > > > Error(Exception)>>handle
>
> > > > > > > > Error(Exception)>>signal
>
> > > > > > > > Error class(Exception class)>>signal: <'Division by zero'>
>
> > > > > > > > BasicRunProgram(Object)>>error: <'Division by zero'>
>
> > > > > > > > BasicRunProgram(BasicProgram)>>terminateRun: <aZeroDivide>
>
> > > > > > > > [] in BasicProgram>>errorHandlerBlock
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7606. Signal Interference

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 15:02:13 UTC
From: Sam
Topic: 7606 Message: 7606

I have posted a document on my web site that analyzes the significance of VNA measurement errors that can result from interference by signals of various strengths, compared to the signal of interest:

<http://www.wetterlin.org/sam/SA/Operation/Interference.pdf>

This interference can result from leakage in switching mechanisms, or any type of direct leakage from VNA output to input. It can also arise
from reflections that occur at VNA output or input. Even the effects of bridge directivity can be viewed as an interference issue.

I developed a table to show what the maximum errors are (for dB and phase) for an interfering signal that is a given level below the main signal, from -10 dB down to -60 dB.

At the end, I discuss the "VHF Transmission/Reflection Test Set", which is part of Jim's group buy PCB. It allows both transmission and reflection measurements at lower frequencies (to 100 MHz or 150 MHz) with a minimum of calibration and interference issues.

Sam W.

7607. Re: [spectrumanalyzer] Filter plus GROUP BUY. An update.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 15:11:08 UTC
From: william sprowls
Topic: 7603 Message: 7607

Hi Jim and All,
I would point out that the SLIM-IFA-33 is a specialized amplifier, but it is constructed on a general purpose printed wiring board called "PWB_RFA". You can build the 1024 MHz buffer amplifier on this pwb by replacing L1(L2) with a 68 nH or similar choke. Replace the filter circuit (C26,L27,C28) with an appropriate resistive pi type attenuator. You can add the 15 dB input attenuator (resistive pi type) to the pads at X21, X22 (R22), and X24.
 Also, this is a dual amplifier board and you need not populate the U2 side.
 I will update the web page for this pwb.
Scotty

--- On Wed, 2/9/11, jghbeta <jghalpha@...> wrote:

From: jghbeta <jghalpha@...>
Subject: [spectrumanalyzer] Filter plus GROUP BUY. An update.
To: spectrumanalyzer@yahoogroups.com
Date: Wednesday, February 9, 2011, 7:13 AM

New scoop:

By artfully rearranging the individual PCBs and a little increase in board size I have been able to add the diplexer PCB (by popular demand) and the "zero response zapper" by Scotty/SamW. Here is what Sam says about it:

quote

Scotty pointed out that the "zero response" that actually extends up to 1 MHz or so in VNA modes, can be significantly reduced by adding a buffer amplifier in the path from PLO2 to Mixer 3. This prevents LO3 from leaking back into PLO2. Essentially, this requires 15 dB of attenuation, followed by 18 dB of gain from an ERA-33 or similar MMIC, followed by 3 dB attenuation on the output. I made up the attached layout for such an amp, which is about 1.2" x 0.9" and is designed to be placed "in-line", with its connectors sticking out each end. That way it can be placed in the cabling from PLO2 to Mixer 3. I haven't done the schematic yet, but it is similar to the MMIC amp on the Signal Router board--but that one was a little more complex because it was also designed to provide power for other boards. This one can be built as normal MMIC-plus-inductor (the inductor actually fits on the R6 pad), or it can be an inductorless buffer amp such as the one I use on
my TG output.

unquote

I might add: If you use a male SMA in one end you could connect directly to MXR3.

There is a great deal of interest in this board. So, those of you still on the fence, don't miss out!

Jim W1JGH

7608. Re: [spectrumanalyzer] Re: Group Buy: The deadline nears

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 16:18:26 UTC
From: Steven Doyle
Topic: 7590 Message: 7608

Hi,

Please add me to the group buy.

thanks

Steve
G1YLB

From: taishan_ma
Sent: Wednesday, February 09, 2011 7:51 AM
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Re: Group Buy: The deadline nears

Jim,

Sorry to bother you, could you please send the attachment zip file to me, I tried several times but can't download it, and don't know why.

thanks!

bg6khc

--- In mailto:spectrumanalyzer%40yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> Hi Phil,
>
> If you read to the end of the document, in its second page, there are
> detailed instructions on how to do it.
>
> Jim
>
> On Mon, Feb 7, 2011 at 9:38 PM, Phil Sittner <sittners@...> wrote:
>
> >
> >
> > Jim-
> >
> > Count me in for one set. I didn't note how or when you want payment-any
> > method is fine.
> >
> > Phil
> > kd6rm
> >
> > ----- Original Message -----
> > *From:* jghbeta <jghalpha@...>
> > *To:* mailto:spectrumanalyzer%40yahoogroups.com

> > *Sent:* Monday, February 07, 2011 5:36 PM
> > *Subject:* [spectrumanalyzer] Group Buy: The deadline nears
> >
> >
> >
> > I will be closing taking orders on Sunday, February 13.
> > Look for message 7575 "Board Group Buy" for details.
> > In addition to what is described there it will include a couple of
> > additional boards. One of them has to do with something that Scotty and SamW
> > have come up with. For now I'll say that it has to do with cleaning up the
> > "zero response".
> > It is a great collection for the serious experimenter!
> >
> > Jim W1JGH
> >
> >
> >
>
>
>
> --
> Jim G. Hontoria
>

7609. Re: Filter plus GROUP BUY. An update.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 16:33:42 UTC
From: Sam
Topic: 7603 Message: 7609

Yes, the PWB_RFA will work well for the PLO2 buffer amp. The board that is included on Jim's PCB has only one amp stage and is slightly down-sized to 0.9"x1.2". It is designed to have connectors sticking out opposite ends, which might be more convenient if you don't want to actually mount it in the grid, but want to have it "float" in the cabling. But if someone has an extra PWB_RFA, there is no strong reason not to use it.

The other thing this board will accommodate is a 1206 resistor in place of the inductor. This lets you build a broadband amp that extends to fairly low frequencies, so long as you accept lower gain, which is perfect for something such as a TG buffer amplifier. That resistor can effectively become the first leg of an output attenuator, which can also give the output very good return loss. Likewise, an attenuator on the input can provide excellent input return loss. Altogether, it can provide good in/out return loss and reverse isolation, with just a few dB of gain, which is why I refer to it as a buffer amp.

The inductorless design does not work for the PLO2 buffer, because the minimum output attenuation is about 6 dB. So for that purpose the inductor would be used, which is fine because there is no need for broadband amplification. For that purpose the PWB_RFA board is just as good.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Jim and All,
> I would point out that the SLIM-IFA-33 is a specialized amplifier, but it is constructed on a general purpose printed wiring board called "PWB_RFA". You can build the 1024 MHz buffer amplifier on this pwb by replacing L1(L2) with a 68 nH or similar choke. Replace the filter circuit (C26,L27,C28) with an appropriate resistive pi type attenuator. You can add the 15 dB input attenuator (resistive pi type) to the pads at X21, X22 (R22), and X24.
> Â Also, this is a dual amplifier board and you need not populate the U2 side.
> Â I will update the web page for this pwb.
> Scotty
>
> --- On Wed, 2/9/11, jghbeta <jghalpha@...> wrote:
>
> From: jghbeta <jghalpha@...>
> Subject: [spectrumanalyzer] Filter plus GROUP BUY. An update.
> To: spectrumanalyzer@yahoogroups.com
> Date: Wednesday, February 9, 2011, 7:13 AM
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> New scoop:
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>
> By artfully rearranging the individual PCBs and a little increase in board size I have been able to add the diplexer PCB (by popular demand) and the "zero response zapper" by Scotty/SamW. Here is what Sam says about it:
>
>
>
> quote
>
> Scotty pointed out that the "zero response" that actually extends up to 1 MHz or so in VNA modes, can be significantly reduced by adding a buffer amplifier in the path from PLO2 to Mixer 3. This prevents LO3 from leaking back into PLO2. Essentially, this requires 15 dB of attenuation, followed by 18 dB of gain from an ERA-33 or similar MMIC, followed by 3 dB attenuation on the output. I made up the attached layout for such an amp, which is about 1.2" x 0.9" and is designed to be placed "in-line", with its connectors sticking out each end. That way it can be placed in the cabling from PLO2 to Mixer 3. I haven't done the schematic yet, but it is similar to the MMIC amp on the Signal Router board--but that one was a little more complex because it was also designed to provide power for other boards. This one can be built as normal MMIC-plus-inductor (the inductor actually fits on the R6 pad), or it can be an inductorless buffer amp such as the one I use on
> my TG output.
>
> unquote
>
>
>
> I might add: If you use a male SMA in one end you could connect directly to MXR3.
>
>
>
> There is a great deal of interest in this board. So, those of you still on the fence, don't miss out!
>
>
>
> Jim W1JGH
>

7610. Filter plus GROUP BUY

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 19:15:16 UTC
From: jghbeta
Topic: 7610 Message: 7610

Hi everyone,

A huge favor to ask:
I am being flooded with nice expressions of interest but at this time we are in Phase 2, which means receiving orders through PayPal. Phase 1 was to measure interest and see if the group buy would be justified and determine cost.
Email #7575 in the spectrumanalyzer yahoo site has the details on how to make payments.
Remember that the US Post Office does not insure overseas mailings, therefore the boards ship at you own risk.

Jim W1JGH

7611. SLIM Amplifier/Buffer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 20:01:45 UTC
From: wsprowls
Topic: 7611 Message: 7611

Hi All,
I am in the process of releasing the "SLIM-RFA-1". It is specifically designed to be the Buffer/Isolator/Amplifier between PLO 2 and Mixer 3. This is for those wishing to decrease the "zero" interference.
I finished the web page dealing with the printed wiring board:
http://www.scottyspectrumanalyzer.com/pwb_rfa.html
This is the identical PWB that is used for the SLIM-IFA-33
I should have the web page for the SLIM-RFA-1 finished sometime today.
I would remind everyone, this module is not a "must" for the VNA, but it is an improvement.
Scotty

7612. Re: PDM testing using DDS1 and DDS3

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 20:13:31 UTC
From: wsprowls
Topic: 7582 Message: 7612

David,
I'm sorry I didn't answer your question earlier. Had my head somewhere!
Yes, you can.
You can set up your VNA to sweep anywhere.
Halt the sweep.
Open Special Tests Window
Command DDS 1 to 10.70 MHz
Command DDS 3 to 10.700001 (1 Hz difference)
Connect each DDS output to the inputs of the PDM
In Main Window, click "Continue"
You should get a sawtooth on the Phase trace that transitions every 1 second. Play with the DDS 3 frequency for other rep rates.
Scotty

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Folks,
>
> Is it possible to test the PDM using only DDS1 and DDS3 (no mixers or PLOs)? I wondered if a similar trick using "DDS1 sweep" to test the RWB filters could be applied here.
>
> If it is possible, could this configuration be used as a VNA for testing at IF2 frequencies?
>
> Thanks,
>
> davidh
>

7613. Re: SLIM Amplifier/Buffer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 21:10:11 UTC
From: Sam
Topic: 7611 Message: 7613

Let me suggest another possibility as well. You can obtain isolation at the most critical frequencies--the vicinity of 1024 MHz--with an ferrite isolator. The isolation would not be as good as with the buffer amp, but it may be plenty. Isolators are also bigger than the buffer amp. But you don't have to provide power to the isolator. Besides, I've never used an isolator in an actual gadget, so it might be fun.

Here is a circulator for sale on eBay ($20+$10 shipping):

<http://cgi.ebay.com/Teledyne-Microwave-24022-Circulator-C-1S23T-9-/140282345859?pt=LH_DefaultDomain_0&hash=item20a97ab983>

The seller has a lot of them. An isolator, which is what we want, is just a circulator (which the eBay item is) with port 3 terminated in 50 ohms. You run the signal (LO2) from port 1 to port 2 with loss of a few tenths of a dB; any signal entering port 2 (which in our case would be the unwanted LO3) is supposed to get routed to the termination at port 3, with very little of it reaching port 1 (PLO2, which we are trying to protect from contamination).

As it happens, I have a Teledyne isolator with the same part number and appearance as this eBay Teledyne circulator, but my port 3 has a connector with built-in termination rather than an SMA connector. But I assume the matching part number means they are for the same frequency range. The eBay seller does not know the range of his (so they likely won't sell well), but mine is 950-1150 MHz. The isolation of mine is about 25 dB in a broad range around 1024 MHz and actually increases to 39 dB not too far inside the edges of the range.

There are also several other circulators or isolators listed expressly for the 950-1150 MHz range. E.g.:

<http://cgi.ebay.com/Teledyne-C-1S13T-3-Circulator-950-1150MHz-20dB-Isolat-/220609218325?pt=LH_DefaultDomain_0&hash=item335d558715>

This is another Teledyne circulator with the same part number but a totally different look. It is advertised as 950-1150 MHz with an isolation spec of 20 dB.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@...> wrote:
>
> Hi All,
> I am in the process of releasing the "SLIM-RFA-1". It is specifically designed to be the Buffer/Isolator/Amplifier between PLO 2 and Mixer 3. This is for those wishing to decrease the "zero" interference.
> I finished the web page dealing with the printed wiring board:
> http://www.scottyspectrumanalyzer.com/pwb_rfa.html
> This is the identical PWB that is used for the SLIM-IFA-33
> I should have the web page for the SLIM-RFA-1 finished sometime today.
> I would remind everyone, this module is not a "must" for the VNA, but it is an

improvement.
> Scotty
>

7614. Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 21:18:44 UTC
From: Sam
Topic: 7573 Message: 7614

Simon,
I think you are exactly right. Very good catch.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "SFC" <sf-cillari@...> wrote:
>
> Hi,
>
> While we are on the subject, I found some minor flaws I think:
>
> [DDS3Track]'ver111-39d
> 'This uses DDS3 as a Tracking Generator, but is limited to 0 to 32 MHz, when MasterClock is 64 MHz
> 'DDS3 spare output is rich in harmonics and aliases.
> 'Tracks the values in Working Window, Center Frequency and Sweep Width (already in the command arrays)
> 'The Spectrum Analyzer function is not effected.
> 'PLO3, Normal Tracking Generator, and Phase portion of VNA will be non-functional
> -
> -
> -
> if cb = 0 then gosub [CommandDDS3OrigCB]'will command DDS 3, only
> 'delver113-4a if cb = 2 then gosub [CommandDDS3SlimCB]'will command DDS 3, only
> if cb = 2 then gosub [CommandAllSlims]'will command all 4 modules. ver113-4a
> if cb = 3 then gosub [CommandAllSlimsUSB]'will command all 4 modules. ver113-4a 'USB:01-08-2010
> > if cb = 3 then gosub [CommandAllSlimsUSB]'will command all 4 modules. ver113-4a 'USB:01-08-2010
> wait
>
> This line seems to belong to the routine below?
>
>
> [DDS1Sweep]'ver112-2c
> 'This forces the DDS 1 to the values in Working Window: Center Frequency and Sweep Width (already in the command arrays)
> 'DDS1 spare output is rich in harmonics and aliases.
> 'PLO1, and thus, the Spectrum Analyzer will be non-functional in this mode.
> 'Signal Generator or Tracking Generator output will not be effected.
> -
> -
> -
> -
> if cb = 0 then gosub [CommandDDS1OrigCB]'will command DDS 1, only
> 'delver113-4a if cb = 2 then gosub [CommandDDS1SlimCB]'will command DDS 1, only

```
> if cb = 2 then gosub [CommandAllSlims]'will command all 4 modules. ver113-4a
> >
>
> wait
>
>
> Simon
>
```

7615. Re: PDM testing using DDS1 and DDS3

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-09 23:18:37 UTC
From: davidhooau
Topic: 7582 Message: 7615

Hi Scotty,

Many thanks, this works well. I also connected the DDS 1 main output to the PDM ref, and the aux output to the LD input (and hence to the PDM input via the LD output) and got a nice picture of the DDS filter response.

Cheers,

davidh

--- In spectrumanalyzer@yahoogroups.com, "wsprowls" <wsprowls@...> wrote:
>
> David,
> I'm sorry I didn't answer your question earlier. Had my head somewhere!
> Yes, you can.
> You can set up your VNA to sweep anywhere.
> Halt the sweep.
> Open Special Tests Window
> Command DDS 1 to 10.70 MHz
> Command DDS 3 to 10.700001 (1 Hz difference)
> Connect each DDS output to the inputs of the PDM
> In Main Window, click "Continue"
> You should get a sawtooth on the Phase trace that transitions every 1 second. Play with the DDS 3 frequency for other rep rates.
> Scotty
>
>
> --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> >
> > Folks,
> >
> > Is it possible to test the PDM using only DDS1 and DDS3 (no mixers or PLOs)? I wondered if a similar trick using "DDS1 sweep" to test the RWB filters could be applied here.
> >
> > If it is possible, could this configuration be used as a VNA for testing at IF2 frequencies?
> >
> > Thanks,
> >
> > davidh
> >
>

7616. New SLIM-RFA-1

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-10 02:57:48 UTC
From: wsprowls
Topic: 7616 Message: 7616

Hi All,
I have completed the Web Page for the Buffer Amplifier:
http://www.scottyspectrumanalyzer.com/slim_rfa_1.html
It can be used as the Buffer/Isolator between PLO 2 and Mixer 3. It is designed to have 0 dB gain, with about -38 dB of reverse isolation.
Scotty

7617. P+ Marker in 116

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-10 06:56:09 UTC
From: davidhooau
Topic: 7617 Message: 7617

Hi,

I'm not sure if I should post this here, or send a message to someone in particular about software problems.

In ver 116, placing a P+ marker in SA mode always places it at 0Hz. P-, L, R etc work fine.

Also, using the filter analysis function, when a peak is visible, causes the application to crash; let me know if the log needs to be sent to someone who cares. The message looks innocuous enough:

```
Please Note:
#handle
#special
These handles closed by Liberty BASIC.
Please add the appropriate CLOSE commands.
```

And the log starts with:

```
Runtime error: Bad command for #handle, COLOR

Error(Exception)>>defaultAction
Error(Exception)>>activateHandler: <anUndefinedObject>
Error(Exception)>>handle
Error(Exception)>>signal
Error class(Exception class)>>signal: <'Bad command for #han...'>
BasicRunProgram(Object)>>error: <'Bad command for #han...'>
```

davidh

7618. Re: [spectrumanalyzer] P+ Marker in 116

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-10 14:16:55 UTC
From: william sprowls
Topic: 7617 Message: 7618

Hi David,
 We (Sam and I) definitely care. Yes, this is a good forum to report software or hardware errors. This way, we can get to them quickly.
 The P markers and Filter analysis worked before, so it is probably a minor bug when transitioning the software to ver 116. Sam is working the filter analysis bug, but he may not have known about the P+ error.
Scotty

--- On Thu, 2/10/11, davidhooau <dhooke@...> wrote:

From: davidhooau <dhooke@...>
Subject: [spectrumanalyzer] P+ Marker in 116
To: spectrumanalyzer@yahoogroups.com
Date: Thursday, February 10, 2011, 12:56 AM

Hi,

I'm not sure if I should post this here, or send a message to someone in particular about software problems.

In ver 116, placing a P+ marker in SA mode always places it at 0Hz. P-, L, R etc work fine.

Also, using the filter analysis function, when a peak is visible, causes the application to crash; let me know if the log needs to be sent to someone who cares. The message looks innocuous enough:

Please Note:

#handle

#special

These handles closed by Liberty BASIC.

Please add the appropriate CLOSE commands.

And the log starts with:

Runtime error: Bad command for #handle, COLOR

Error(Exception)>>defaultAction

Error(Exception)>>activateHandler: <anUndefinedObject>

Error(Exception)>>handle

Error(Exception)>>signal

Error class(Exception class)>>signal: <'Bad command for #han...'>

```
BasicRunProgram(Object)>>error: <'Bad command for #han...'>
```

davidh

7619. Re: P+ Marker in 116

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-10 16:34:17 UTC
From: Sam
Topic: 7617 Message: 7619

The filter analysis is fixed, but I have not yet posted the fixed version. The P+ marker works for me. It automatically locates at the peak, so if your peak is at 0 Hz, it will go there no matter where you click.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi David,
> Â We (Sam and I) definitely care. Yes, this is a good forum to report software or hardware errors. This way, we can get to them quickly.
> Â The P markers and Filter analysis worked before, so it is probably a minor bug when transitioning the software to ver 116. Sam is working the filter analysis bug, but he may not have known about the P+ error.
> Scotty
>
> --- On Thu, 2/10/11, davidhooau <dhooke@...> wrote:
>
> From: davidhooau <dhooke@...>
> Subject: [spectrumanalyzer] P+ Marker in 116
> To: spectrumanalyzer@yahoogroups.com
> Date: Thursday, February 10, 2011, 12:56 AM
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>
> Hi,
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>
> I'm not sure if I should post this here, or send a message to someone in particular about software problems.
>

>
>
> In ver 116, placing a P+ marker in SA mode always places it at 0Hz. P-, L, R etc work fine.
>
>
>
> Also, using the filter analysis function, when a peak is visible, causes the application to crash; let me know if the log needs to be sent to someone who cares. The message looks innocuous enough:
>
>
>
> Please Note:
>
> #handle
>
> #special
>
> These handles closed by Liberty BASIC.
>
> Please add the appropriate CLOSE commands.
>
>
>
> And the log starts with:
>
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>
> Runtime error: Bad command for #handle, COLOR
>
>
>
> Error(Exception)>>defaultAction
>
> Error(Exception)>>activateHandler: <anUndefinedObject>
>
> Error(Exception)>>handle
>
> Error(Exception)>>signal
>
> Error class(Exception class)>>signal: <'Bad command for #han...'>
>
> BasicRunProgram(Object)>>error: <'Bad command for #han...'>
>
>
>
> davidh
>

7620. Re: P+ Marker in 116

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-10 18:32:44 UTC
From: davidhooau
Topic: 7617 Message: 7620

Hi Sam,

* With series crystal fixture between DDS1 and LD:
* Start MSA
* Halt
* Sweep, centre = 10.7MHz, OK
* Restart, Halt
* Special tests -> DDS1 sweep
* Continue (I have peak at 10.6985MHz -9dBm)
* Marker, P+, Double click on peak
* Marker text appears on screen at 0Hz -63.615dBm

If I place P+ prior to selecting DDS1 sweep, it is placed correctly.

The same sequence is fine with 115.

HTH,

davidh

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> The filter analysis is fixed, but I have not yet posted the fixed version. The P+ marker works for me. It automatically locates at the peak, so if your peak is at 0 Hz, it will go there no matter where you click.
> Sam W.
>
> --- In spectrumanalyzer@...m, william sprowls <wsprowls@> wrote:
> >
> > Hi David,
> > Â We (Sam and I) definitely care. Yes, this is a good forum to report software or hardware errors. This way, we can get to them quickly.
> > Â The P markers and Filter analysis worked before, so it is probably a minor bug when transitioning the software to ver 116. Sam is working the filter analysis bug, but he may not have known about the P+ error.
> > Scotty
> >
> > --- On Thu, 2/10/11, davidhooau <dhooke@> wrote:
> >
> > From: davidhooau <dhooke@>
> > Subject: [spectrumanalyzer] P+ Marker in 116
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Thursday, February 10, 2011, 12:56 AM
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> > Hi,
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> >
> > I'm not sure if I should post this here, or send a message to someone in particular about software problems.
> >
> >
> >
> > In ver 116, placing a P+ marker in SA mode always places it at 0Hz. P-, L, R etc work fine.
> >
> >
> >
> > Also, using the filter analysis function, when a peak is visible, causes the application to crash; let me know if the log needs to be sent to someone who cares. The message looks innocuous enough:
> >
> >
> >
> > Please Note:
> >
> > #handle
> >
> > #special
> >
> > These handles closed by Liberty BASIC.
> >
> > Please add the appropriate CLOSE commands.
> >
> >
> >
> > And the log starts with:
> >
> >
> >

```
> > Runtime error: Bad command for #handle, COLOR
> >
> >
> >
> > Error(Exception)>>defaultAction
> >
> > Error(Exception)>>activateHandler: <anUndefinedObject>
> >
> > Error(Exception)>>handle
> >
> > Error(Exception)>>signal
> >
> > Error class(Exception class)>>signal: <'Bad command for #han...'>
> >
> > BasicRunProgram(Object)>>error: <'Bad command for #han...'>
> >
> >
> >
> > davidh
> >
>
```

7621. Re: [spectrumanalyzer] Re: P+ Marker in 116

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-10 19:12:08 UTC
From: william sprowls
Topic: 7617 Message: 7621

Hi David,
 I think I can answer this one. I created the Special Test/DDS sweep with the intention of using only the Center Frequency and Span from the main window to control the DDS. All other functions that are in the Menu items were not expected to be used during this Special Test. Some may work, but it is purely accidental.
Scotty

--- On Thu, 2/10/11, davidhooau <dhooke@...> wrote:

From: davidhooau <dhooke@...>
Subject: [spectrumanalyzer] Re: P+ Marker in 116
To: spectrumanalyzer@yahoogroups.com
Date: Thursday, February 10, 2011, 12:32 PM

Hi Sam,

* With series crystal fixture between DDS1 and LD:

* Start MSA

* Halt

* Sweep, centre = 10.7MHz, OK

* Restart, Halt

* Special tests -> DDS1 sweep

* Continue (I have peak at 10.6985MHz -9dBm)

* Marker, P+, Double click on peak

* Marker text appears on screen at 0Hz -63.615dBm

If I place P+ prior to selecting DDS1 sweep, it is placed correctly.

The same sequence is fine with 115.

HTH,

davidh

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:

>

> The filter analysis is fixed, but I have not yet posted the fixed version. The P+ marker works for me. It automatically locates at the peak, so if your peak is at 0 Hz, it will go there no matter where you click.

> Sam W.

>

> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:

> >

> > Hi David,

> > Â We (Sam and I) definitely care. Yes, this is a good forum to report software or hardware errors. This way, we can get to them quickly.

> > Â The P markers and Filter analysis worked before, so it is probably a minor bug when transitioning the software to ver 116. Sam is working the filter analysis bug, but he may not have known about the P+ error.

> > Scotty

> >

> > --- On Thu, 2/10/11, davidhooau <dhooke@> wrote:

> >

> > From: davidhooau <dhooke@>

> > Subject: [spectrumanalyzer] P+ Marker in 116

> > To: spectrumanalyzer@yahoogroups.com

> > Date: Thursday, February 10, 2011, 12:56 AM

> >

> >

> >

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> >

> > Hi,

> >

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> >

> > I'm not sure if I should post this here, or send a message to someone in particular about software problems.

> >

> >

> >

> > In ver 116, placing a P+ marker in SA mode always places it at 0Hz. P-, L, R etc work fine.

> >

> >

> >

> > Also, using the filter analysis function, when a peak is visible, causes the application to crash; let me know if the log needs to be sent to someone who cares. The message looks innocuous enough:

> >

> >

> >

> > Please Note:

> >

> > #handle

> >

> > #special

> >

> > These handles closed by Liberty BASIC.

```
> >
> > Please add the appropriate CLOSE commands.
> >
> >
> >
> > And the log starts with:
> >
> >
> >
> > Runtime error: Bad command for #handle, COLOR
> >
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> >
> > Error(Exception)>>defaultAction
> >
> > Error(Exception)>>activateHandler: <anUndefinedObject>
> >
> > Error(Exception)>>handle
> >
> > Error(Exception)>>signal
> >
> > Error class(Exception class)>>signal: <'Bad command for #han...'>
> >
> > BasicRunProgram(Object)>>error: <'Bad command for #han...'>
> >
> >
> >
> > davidh
> >
```

>

7622. Re: P+ Marker in 116

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-10 19:15:23 UTC
From: Sam
Topic: 7617 Message: 7622

David,
I am not able to recreate that. Does your sweep actually include 0Hz, and the marker gets placed there, or does it get placed at some non-zero frequency but the text at the bottom shows it as 0 Hz?
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Hi Sam,
>
> * With series crystal fixture between DDS1 and LD:
> * Start MSA
> * Halt
> * Sweep, centre = 10.7MHz, OK
> * Restart, Halt
> * Special tests -> DDS1 sweep
> * Continue (I have peak at 10.6985MHz -9dBm)
> * Marker, P+, Double click on peak
> * Marker text appears on screen at 0Hz -63.615dBm
>
> If I place P+ prior to selecting DDS1 sweep, it is placed correctly.
>
> The same sequence is fine with 115.
>
> HTH,
>
> davidh
>
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > The filter analysis is fixed, but I have not yet posted the fixed version. The P+ marker works for me. It automatically locates at the peak, so if your peak is at 0 Hz, it will go there no matter where you click.
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > >
> > > Hi David,
> > > Â We (Sam and I) definitely care. Yes, this is a good forum to report software or hardware errors. This way, we can get to them quickly.
> > > Â The P markers and Filter analysis worked before, so it is probably a minor bug when transitioning the software to ver 116. Sam is working the filter analysis bug, but he may not have known about the P+ error.
> > > Scotty

> > >
> > > --- On Thu, 2/10/11, davidhooau <dhooke@> wrote:
> > >
> > > From: davidhooau <dhooke@>
> > > Subject: [spectrumanalyzer] P+ Marker in 116
> > > To: spectrumanalyzer@...m
> > > Date: Thursday, February 10, 2011, 12:56 AM
> > >
> > >
> > >
> > >
> > >
> > >
> > >
> > > Â
> > >
> > >
> > >
> > >
> > >
> > >
> > >
> > >
> > >
> > > Hi,
> > >
> > >
> > >
> > > I'm not sure if I should post this here, or send a message to someone in particular about software problems.
> > >
> > >
> > >
> > > In ver 116, placing a P+ marker in SA mode always places it at 0Hz. P-, L, R etc work fine.
> > >
> > >
> > >
> > > Also, using the filter analysis function, when a peak is visible, causes the application to crash; let me know if the log needs to be sent to someone who cares. The message looks innocuous enough:
> > >
> > >
> > >
> > > Please Note:
> > >
> > > #handle
> > >
> > > #special
> > >

```
> > > These handles closed by Liberty BASIC.
> > >
> > > Please add the appropriate CLOSE commands.
> > >
> > >
> > >
> > > And the log starts with:
> > >
> > >
> > >
> > > Runtime error: Bad command for #handle, COLOR
> > >
> > >
> > >
> > > Error(Exception)>>defaultAction
> > >
> > > Error(Exception)>>activateHandler: <anUndefinedObject>
> > >
> > > Error(Exception)>>handle
> > >
> > > Error(Exception)>>signal
> > >
> > > Error class(Exception class)>>signal: <'Bad command for #han...'>
> > >
> > > BasicRunProgram(Object)>>error: <'Bad command for #han...'>
> > >
> > >
> > >
> > > davidh
> > >
> >
>
```

7623. Re: [spectrumanalyzer] Re: MSA V116 and divide by zero error

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-10 19:45:45 UTC
From: SFC
Topic: 7573 Message: 7623

Sam,

Here's another funny one. I'm using a 7.5khz rbw and if I set the span to 0.075 mhz I can step a marker only down with the "+ / -" buttons not up. At 0 Mhz I can move only up not down (?) When I change the span to any other value then 75khz all is well.

Simon

----- Original Message -----
From: Sam
To: spectrumanalyzer@yahoogroups.com
Sent: Wednesday, February 09, 2011 10:18 PM
Subject: [spectrumanalyzer] Re: MSA V116 and divide by zero error

Simon,
I think you are exactly right. Very good catch.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "SFC" <sf-cillari@...> wrote:
>
> Hi,
>
> While we are on the subject, I found some minor flaws I think:
>
> [DDS3Track]'ver111-39d
> 'This uses DDS3 as a Tracking Generator, but is limited to 0 to 32 MHz, when MasterClock is 64 MHz
> 'DDS3 spare output is rich in harmonics and aliases.
> 'Tracks the values in Working Window, Center Frequency and Sweep Width (already in the command arrays)
> 'The Spectrum Analyzer function is not effected.
> 'PLO3, Normal Tracking Generator, and Phase portion of VNA will be non-functional
> -
> -
> -
> if cb = 0 then gosub [CommandDDS3OrigCB]'will command DDS 3, only
> 'delver113-4a if cb = 2 then gosub [CommandDDS3SlimCB]'will command DDS 3, only
> if cb = 2 then gosub [CommandAllSlims]'will command all 4 modules. ver113-4a
> if cb = 3 then gosub [CommandAllSlimsUSB]'will command all 4 modules. ver113-4a 'USB:01-08-2010
> > if cb = 3 then gosub [CommandAllSlimsUSB]'will command all 4 modules. ver113-4a 'USB:01-08-2010
> wait
>
> This line seems to belong to the routine below?
>

```
>
> [DDS1Sweep]'ver112-2c
> 'This forces the DDS 1 to the values in Working Window: Center Frequency and Sweep Width
(already in the command arrays)
> 'DDS1 spare output is rich in harmonics and aliases.
> 'PLO1, and thus, the Spectrum Analyzer will be non-functional in this mode.
> 'Signal Generator or Tracking Generator output will not be effected.
> -
> -
> -
> -
> if cb = 0 then gosub [CommandDDS1OrigCB]'will command DDS 1, only
> 'delver113-4a if cb = 2 then gosub [CommandDDS1SlimCB]'will command DDS 1, only
> if cb = 2 then gosub [CommandAllSlims]'will command all 4 modules. ver113-4a
> >
>
> wait
>
>
> Simon
>
```

_____ NOD32 5860 (20110209) Informatie _____

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http://www.nod32.nl

7624. Searching for LMX2326 chips

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-10 21:10:31 UTC
From: Jurgen
Topic: 7624 Message: 7624

Hello,

I would like to buy 3 x LMX2326.
So far I have been unable to find a source.
Is there a replacement part?

Thanks, Jurgen

7625. Re: [spectrumanalyzer] Searching for LMX2326 chips

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-10 21:31:08 UTC
From: SFC
Topic: 7624 Message: 7625

The ADF4118 is a direct replacement.

Simon

----- Original Message -----
From: Jurgen
To: spectrumanalyzer@yahoogroups.com
Sent: Thursday, February 10, 2011 10:10 PM
Subject: [spectrumanalyzer] Searching for LMX2326 chips

Hello,

I would like to buy 3 x LMX2326.
So far I have been unable to find a source.
Is there a replacement part?

Thanks, Jurgen

_____ NOD32 5863 (20110210) Informatie _____

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http://www.nod32.nl

7626. Re: Searching for LMX2326 chips

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-10 22:05:21 UTC
From: n6tdt
Topic: 7624 Message: 7626

This part number has been discontinued from National Semiconductor.

There has been mention on this forum of a drop in replacement made by Analog Devices though the part number escapes me. I am sure someone
will pop up and give you the correct part number

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> Hello,
>
> I would like to buy 3 x LMX2326.
> So far I have been unable to find a source.
> Is there a replacement part?
>
> Thanks, Jurgen
>

7627. Re: [spectrumanalyzer] Searching for LMX2326 chips

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-10 23:24:14 UTC
From: Jurgen
Topic: 7624 Message: 7627

Thanks Simon,

Did some more searching and found a ADF4113 in my stock. I now remember
that this part was recommended as a replacement some time ago.
This part seems to require a resistor of some value in pin 1 setting the
charge pump current value.
I remember some discussion about this several weeks ago.
The data sheets call the pin FLo or Rset. They might just have the same
function.
Need to study the specs a bit longer.

Jurgen

On 2/10/2011 4:31 PM, SFC wrote:
>
> The ADF4118 is a direct replacement.
> Simon
>
> ----- Original Message -----
> *From:* Jurgen <mailto:khj221@...>
> *To:* spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer@yahoogroups.com>
> *Sent:* Thursday, February 10, 2011 10:10 PM
> *Subject:* [spectrumanalyzer] Searching for LMX2326 chips
>
> Hello,
>
> I would like to buy 3 x LMX2326.
> So far I have been unable to find a source.
> Is there a replacement part?
>
> Thanks, Jurgen
>
>
>
> _____ NOD32 5863 (20110210) Informatie _____
>
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> http://www.nod32.nl
>
>

7628. Re: [spectrumanalyzer] Searching for LMX2326 chips

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-10 23:27:35 UTC
From: Jurgen
Topic: 7624 Message: 7628

Correction.
I mean to say that the data sheets call pin 1 FLo or Rset. That seems to
be the only difference I can see.

On 2/10/2011 6:24 PM, Jurgen wrote:
> Thanks Simon,
>
> Did some more searching and found a ADF4113 in my stock. I now
> remember that this part was recommended as a replacement some time ago.
> This part seems to require a resistor of some value in pin 1 setting
> the charge pump current value.
> I remember some discussion about this several weeks ago.
> The data sheets call the pin FLo or Rset. They might just have the
> same function.
> Need to study the specs a bit longer.
>
> Jurgen
>
>
>
>
> On 2/10/2011 4:31 PM, SFC wrote:
>>
>> The ADF4118 is a direct replacement.
>> Simon
>>
>> ----- Original Message -----
>> *From:* Jurgen <mailto:khj221@...>
>> *To:* spectrumanalyzer@yahoogroups.com
>> <mailto:spectrumanalyzer@yahoogroups.com>
>> *Sent:* Thursday, February 10, 2011 10:10 PM
>> *Subject:* [spectrumanalyzer] Searching for LMX2326 chips
>>
>> Hello,
>>
>> I would like to buy 3 x LMX2326.
>> So far I have been unable to find a source.
>> Is there a replacement part?
>>
>> Thanks, Jurgen
>>
>>
>>
>> _____ NOD32 5863 (20110210) Informatie _____
>>

>> Dit bericht is gecontroleerd door het NOD32 Antivirus Systeem.
>> http://www.nod32.nl
>>
>>

7629. Marker stepping

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-11 00:22:30 UTC
From: Sam
Topic: 7573 Message: 7629

That is strange, but I think I found the problem. It has to do with the fact that frequencies are rounded to the nearest Hz. With small enough intervals between steps, this can cause some odd behavior if the interval is not an integral number of Hz. I think I fixed this particular problem, but other variations are possible with very small intervals between steps. For example, if you do a zero-width scan, you can place markers where you want by clicking, but if you try to move them with + or - they jump to the center. This is because they try to relocate based on their target frequency, and in a zero-width scan everything is at the same frequency.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "SFC" <sf-cillari@...> wrote:
>
> Sam,
>
> Here's another funny one. I'm using a 7.5khz rbw and if I set the span to 0.075 mhz I can step a marker only down with the "+ / -" buttons not up. At 0 Mhz I can move only up not down (?) When I change the span to any other value then 75khz all is well.
>
> Simon
>

7630. Re: [spectrumanalyzer] Searching for LMX2326 chips

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-11 00:47:47 UTC
From: william sprowls
Topic: 7624 Message: 7630

Hi Jurgen,
Yes, ADF4113 is an
option, requiring the use of R23 (4.7 Kohm)
Scotty

--- On Thu, 2/10/11, Jurgen <khj221@...> wrote:

From: Jurgen <khj221@...>
Subject: Re: [spectrumanalyzer] Searching for LMX2326 chips
To: spectrumanalyzer@yahoogroups.com
Date: Thursday, February 10, 2011, 5:24 PM

Thanks Simon,

Did some more searching and found a ADF4113 in my stock. I now
remember that this part was recommended as a replacement some time
ago.

This part seems to require a resistor of some value in pin 1 setting
the charge pump current value.

I remember some discussion about this several weeks ago.

The data sheets call the pin FLo or Rset. They might just have the
same function.

Need to study the specs a bit longer.

Jurgen

On 2/10/2011 4:31 PM, SFC wrote:

The ADF4118 is a direct
replacement.

Simon

----- Original Message

From: Jurgen
To: spectrumanalyzer@yahoogroups.com

Sent: Thursday,
February 10, 2011 10:10 PM
Subject:
[spectrumanalyzer] Searching for LMX2326 chips

Hello,

I would like to buy 3 x LMX2326.

So far I have been unable to find a source.

Is there a replacement part?

Thanks, Jurgen

_____ NOD32 5863 (20110210) Informatie _____

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Systeem.

http://www.nod32.nl

7631. Re: P+ Marker in 116

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-11 04:18:25 UTC
From: davidhooau
Topic: 7617 Message: 7631

Howdy Sam,

My sweep does not include 0Hz. The P+ marker doesn't appear on the screen at all.

As Scotty pointed out, it's fortuitous that the markers worked at all in version 115 for the test configuration I'm using, so please don't invest any effort at all in this matter.

Thanks.

davidh

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> David,
> I am not able to recreate that. Does your sweep actually include 0Hz, and the marker gets placed there, or does it get placed at some non-zero frequency but the text at the bottom shows it as 0 Hz?
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> >
> > Hi Sam,
> >
> > * With series crystal fixture between DDS1 and LD:
> > * Start MSA
> > * Halt
> > * Sweep, centre = 10.7MHz, OK
> > * Restart, Halt
> > * Special tests -> DDS1 sweep
> > * Continue (I have peak at 10.6985MHz -9dBm)
> > * Marker, P+, Double click on peak
> > * Marker text appears on screen at 0Hz -63.615dBm
> >
> > If I place P+ prior to selecting DDS1 sweep, it is placed correctly.
> >
> > The same sequence is fine with 115.
> >
> > HTH,
> >
> > davidh
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > The filter analysis is fixed, but I have not yet posted the fixed version. The P+ marker works for me. It automatically locates at the peak, so if your peak is at 0 Hz, it

will go there no matter where you click.
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > > >
> > > > Hi David,
> > > > Â We (Sam and I) definitely care. Yes, this is a good forum to report software or hardware errors. This way, we can get to them quickly.
> > > > Â The P markers and Filter analysis worked before, so it is probably a minor bug when transitioning the software to ver 116. Sam is working the filter analysis bug, but he may not have known about the P+ error.
> > > > Scotty
> > > >
> > > > --- On Thu, 2/10/11, davidhooau <dhooke@> wrote:
> > > >
> > > > From: davidhooau <dhooke@>
> > > > Subject: [spectrumanalyzer] P+ Marker in 116
> > > > To: spectrumanalyzer@yahoogroups.com
> > > > Date: Thursday, February 10, 2011, 12:56 AM
> > > >
> > > >
> > > >
> > > >
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> > > >
> > > >
> > > >
> > > >
> > > >
> > > >
> > > >
> > > >
> > > >
> > > > Hi,
> > > >
> > > >
> > > >
> > > > I'm not sure if I should post this here, or send a message to someone in particular about software problems.
> > > >
> > > >
> > > >
> > > > In ver 116, placing a P+ marker in SA mode always places it at 0Hz. P-, L, R etc work fine.
> > > >
> > > >
> > > >
> > > > Also, using the filter analysis function, when a peak is visible, causes the

application to crash; let me know if the log needs to be sent to someone who cares. The message looks innocuous enough:
> > > >
> > > >
> > > >
> > > > Please Note:
> > > >
> > > > #handle
> > > >
> > > > #special
> > > >
> > > > These handles closed by Liberty BASIC.
> > > >
> > > > Please add the appropriate CLOSE commands.
> > > >
> > > >
> > > >
> > > > And the log starts with:
> > > >
> > > >
> > > >
> > > > Runtime error: Bad command for #handle, COLOR
> > > >
> > > >
> > > >
> > > > Error(Exception)>>defaultAction
> > > >
> > > > Error(Exception)>>activateHandler: <anUndefinedObject>
> > > >
> > > > Error(Exception)>>handle
> > > >
> > > > Error(Exception)>>signal
> > > >
> > > > Error class(Exception class)>>signal: <'Bad command for #han...'>
> > > >
> > > > BasicRunProgram(Object)>>error: <'Bad command for #han...'>
> > > >
> > > >
> > > >
> > > > davidh
> > > >
> > >
> >
>

7632. Re: Signal Interference

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-11 13:05:17 UTC
From: Sam
Topic: 7606 Message: 7632

I have updated the Interference document, so if you downloaded it you should grab the new one; same URL. I expanded it to cover stronger interference levels, such as interference which is as strong as the measurement itself. The new table, shows, for example, that a bridge with 36 dB directivity can be used without OSL calibration to verify whether return loss is better than 30 dB. If the return loss exceeds 30 dB you often don't care about its exact value. Thus, for many return loss and SWR measurements (which of course don't involve phase), you can use the SA+TG+bridge to measure what you want, without need for the full VNA features.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have posted a document on my web site that analyzes the significance of VNA measurement errors that can result from interference by signals of various strengths, compared to the signal of interest:
>
> <http://www.wetterlin.org/sam/SA/Operation/Interference.pdf>
>
> This interference can result from leakage in switching mechanisms, or any type of direct leakage from VNA output to input. It can also arise
> from reflections that occur at VNA output or input. Even the effects of bridge directivity can be viewed as an interference issue.
>
> I developed a table to show what the maximum errors are (for dB and phase) for an interfering signal that is a given level below the main signal, from -10 dB down to -60 dB.
>
> At the end, I discuss the "VHF Transmission/Reflection Test Set", which is part of Jim's group buy PCB. It allows both transmission and reflection measurements at lower frequencies (to 100 MHz or 150 MHz) with a minimum of calibration and interference issues.
>
> Sam W.
>

7633. 116 Beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-11 15:21:16 UTC
From: Sam
Topic: 7633 Message: 7633

I have posted an updated beta version of the version 116 software:

<http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_version116_4f_Beta.zip>

This has a few bug fixes that have been mentioned. I also included .tkn and .exe files, and an S-Parameter file for a ceramic filter, which can be used for playing with the Two-Port module. Remember that you don't need hardware attached to run the software, so you can try filter matching with the Two-Port module even if your MSA is not finished.

Originally, the Two-Port module would allow certain actions, like filter matching, only if it had a full set of four S-parameters. Now, however, if you have a file with just S11 values, you can load it (after clearing any existing parameters) and a two-port device will be created from it. Your S11 will represent the input; the output is considered to be a shunt 50-ohm resistor, and the input and output are deemed connected by a huge resistor. In essence, this completely isolates the input and output, so nothing that happens at the output affects the input response, which makes it act pretty much as though the output were not there. That will let you see what the "matched" input S11 looks like if you add various matching components to the input.

If you use the .tkn and .exe files, you need to place them in your existing software folder so they have access to the various DLLs that are in that folder. If you have Liberty Basic, you should just run the .bas file. Doing so will require some initial compile time, but once the compile is done the program will run faster than using the .exe. And if you encounter an error, you will usually get more meaningful info about the error if you are actually running under LB.

If you are switching from version 115, you may have to toss your config.txt file before running, though I think I have fixed that problem. In any event, you should run the Configuration Manager to configure automatic switching, and values of your video capacitors.

Sam W.

7634. Error found on my Rev C Control Board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-11 17:31:45 UTC
From: KB9JJA
Topic: 7634 Message: 7634
Attachments: 1 described; binary payloads are missing from this source WARC

I recently purchased a set of boards from someone off the list. I was told they were from a group buy from around May of 2010. I do not have any other details on the boards I have other that that. They all look to be the latest revisions though. While testing the control board I had a short on the 10 volt side of the regulator on the board. I traced the problem down to 3 via's in the 10 volt line to the ground plane. I simply drilled out the via's to remove thier connection I have included a photo of my board and the 3 via's. I searched the board and could not find a reference to this. I am posting this in the hopes that it saves someone else the frustration of tracking this down. If it was posted in the past please forgive the bandwidth.

Dale

7635. Re: Error found on my Rev C Control Board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-11 17:58:43 UTC
From: Sam
Topic: 7634 Message: 7635

Bob Fish arranged a group buy of boards around that time, but I don't recall anybody posting about shorting in the 10V supply. I tried looking at your attachment but got a message saying there was something wrong with the file.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, KB9JJA <kb9jja@...> wrote:
>
> I recently purchased a set of boards from someone off the list. I was told they were from a group buy from around May of 2010. I do not have any other details on the boards I have other that that. They all look to be the latest revisions though. While testing the control board I had a short on the 10 volt side of the regulator on the board. I traced the problem down to 3 via's in the 10 volt line to the ground plane. I simply drilled out the via's to remove thier connection I have included a photo of my board and the 3 via's. I searched the board and could not find a reference to this. I am posting this in the hopes that it saves someone else the frustration of tracking this down. If it was posted in the past please forgive the bandwidth.
>
> Dale
>

7636. Re: [spectrumanalyzer] Error found on my Rev C Control Board [1 Attachment]

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-11 18:03:32 UTC
From: Jurgen
Topic: 7634 Message: 7636

That is strange, you have a rev. C board, I have a ref. B board and
don't have these vias.
You did it rigth.

Jurgen

On 2/11/2011 12:31 PM, KB9JJA wrote:
> I recently purchased a set of boards from someone off the list. I was
> told they were from a group buy from around May of 2010. I do not have
> any other details on the boards I have other that that. They all look
> to be the latest revisions though. While testing the control board I
> had a short on the 10 volt side of the regulator on the board. I
> traced the problem down to 3 via's in the 10 volt line to the ground
> plane. I simply drilled out the via's to remove thier connection I
> have included a photo of my board and the 3 via's. I searched the
> board and could not find a reference to this. I am posting this in the
> hopes that it saves someone else the frustration of tracking this
> down. If it was posted in the past please forgive the bandwidth.
>
> Dale
>
>
>
>

7637. Re: Error found on my Rev C Control Board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-11 19:51:33 UTC
From: Dale
Topic: 7634 Message: 7637

I started a web page for my build. I have a photo of the boards I received as well as a close up of the board with the error if anyone is interested.

http://wentztech.com/radio/SpectrumAnalyser/SA.html

Dale

7638. Re: Error found on my Rev C Control Board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-11 21:34:55 UTC
From: Sam
Topic: 7634 Message: 7638

Nice pictures. The boards look good. Those extra vias are odd, because they certainly aren't on Scotty's Rev C layout and I haven't heard of anyone redoing that layout--don't know why they would. My guess is that in the process of assembling the individual layouts into one big one, an accidental paste occurred that put those vias there. Anyway, once they are drilled out, no harm done.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Dale" <kb9jja@...> wrote:
>
>
>
>
> I started a web page for my build. I have a photo of the boards I received as well as a close up of the board with the error if anyone is interested.
>
> http://wentztech.com/radio/SpectrumAnalyser/SA.html
>
> Dale
>

7639. Re: [spectrumanalyzer] Re: Error found on my Rev C Control Board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-12 00:53:12 UTC
From: william sprowls
Topic: 7634 Message: 7639

Hi Dale,
 As Sam said, that is probably a combination of boards and whoever did it added the vias. It is certainly an error. It is highly likely you are not the only one with the problem. I suggest you take any other board you got from that group buy and inspect it against the released Express documentation from my Web pages. For example, that documentation can be found on:
http://scottyspectrumanalyzer.com/slim_cb_nv.html
 For that particular error, I would suggest the builder turn the board over to the ground side and "ream out" the ground plating in the via with a sharp drill bit. That way, you don't have to drill all the way through the board. This leaves the +10 v trace intact to handle the full current.
 By the way. I opened your attachment with Express without a problem.
Scotty

--- On Fri, 2/11/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: Error found on my Rev C Control Board
To: spectrumanalyzer@yahoogroups.com
Date: Friday, February 11, 2011, 3:34 PM

Nice pictures. The boards look good. Those extra vias are odd, because they certainly aren't on Scotty's Rev C layout and I haven't heard of anyone redoing that layout--don't know why they would. My guess is that in the process of assembling the individual layouts into one big one, an accidental paste occurred that put those vias there. Anyway, once they are drilled out, no harm done.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Dale" <kb9jja@...> wrote:

>

>

>

>

> I started a web page for my build. I have a photo of the boards I received as well as a close up of the board with the error if anyone is interested.

>

> http://wentztech.com/radio/SpectrumAnalyser/SA.html

>

> Dale

Don't get soaked. Take a quick peek at the forecast
with the Yahoo! Search weather shortcut.
http://tools.search.yahoo.com/shortcuts/#loc_weather

7640. DDS Rev D issue

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-12 03:36:40 UTC
From: radiotalk@xtra.co.nz
Topic: 7640 Message: 7640

Hi Scotty / Sam

Looking at the output J4 with a scope, DDS non-commanded, I have a 1380Hz 50% duty cycle 5v p-p waveform. I have removed C30 and U3 (7SZ04MX4) still self oscillates, removing C31 changes the freq to 17kHz or R10 stops the oscillation. It doesn't matter if J4 is terminated (via capacitor to 50 ohms) or o/c.

If commanded, a very short pulse width square wave appears at J2 & J3.

Is this meant to occur?

Regards

Chris

7641. Re: [spectrumanalyzer] DDS Rev D issue

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-12 04:34:46 UTC
From: william sprowls
Topic: 7640 Message: 7641

Hi Chris,
It possible for U3 to oscillate at this low frequency if there is no input signal to U3. This occurs when the DDS is either not commanded or if it is commanded to a frequency outside of the bandwidth of the DDS filter (10.7 MHz).
  For the MSA, the only time the DDS is commanded outside of its normal bandwidth is during "Special Testing" and its subsequent PLO doesn't care if it gets a "weird" oscillating signal.
  It is not possible for an oscillation to occur if U3 is removed.
Scotty

--- On Fri, 2/11/11, radiotalk@... <chris@...> wrote:

From: radiotalk@... <chris@...>
Subject: [spectrumanalyzer] DDS Rev D issue
To: spectrumanalyzer@yahoogroups.com
Date: Friday, February 11, 2011, 9:36 PM

Hi Scotty / Sam

Looking at the output J4 with a scope, DDS non-commanded, I have a 1380Hz 50% duty cycle 5v p-p waveform. I have removed C30 and U3 (7SZ04MX4) still self oscillates, removing C31 changes the freq to 17kHz or R10 stops the oscillation. It doesn't matter if J4 is terminated (via capacitor to 50 ohms) or o/c.

If commanded, a very short pulse width square wave appears at J2 & J3.

Is this meant to occur?

Regards

Chris

_____
Bored stiff? Loosen up...
Download and play hundreds of games for free on Yahoo! Games.
http://games.yahoo.com/games/front

7642. Re: Error found on my Rev C Control Board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-12 04:47:50 UTC
From: inlinebeginner
Topic: 7634 Message: 7642

Hi Dale
This is the set that I ordered by myself last May, and I did not use them because I bought another set of boards with some components on right after I sent the order out.
Sorry for the errors. I did not realize that there are errors, otherwise I would double check them before I sent to you. I will spend some time to check the rest of boards for you, and send you a check list.
Sorry for the inconvenience.
Lin

--- In spectrumanalyzer@yahoogroups.com, KB9JJA <kb9jja@...> wrote:
>
> I recently purchased a set of boards from someone off the list. I was told they were from a group buy from around May of 2010. I do not have any other details on the boards I have other that that. They all look to be the latest revisions though. While testing the control board I had a short on the 10 volt side of the regulator on the board. I traced the problem down to 3 via's in the 10 volt line to the ground plane. I simply drilled out the via's to remove thier connection I have included a photo of my board and the 3 via's. I searched the board and could not find a reference to this. I am posting this in the hopes that it saves someone else the frustration of tracking this down. If it was posted in the past please forgive the bandwidth.
>
> Dale
>

7643. Re: DDS Rev D issue

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-12 14:08:54 UTC
From: Sam
Topic: 7640 Message: 7643

As Scotty said, oscillation of U3 is normal with no input coming through the 10.7 MHz filter. But once it is receiving a signal, the output should be a square wave with near 50% duty cycle, not a short pulse. Check the signal strength into and out of the filter. I don't recall what it should be, but I suspect the signal coming out of your filter is tiny, as in a few mV.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Chris,
> It possible for U3 to oscillate at this low frequency if there is no input signal to U3. This occurs when the DDS is either not commanded or if it is commanded to a frequency outside of the bandwidth of the DDS filter (10.7 MHz).
> Â For the MSA, the only time the DDS is commanded outside of its normal bandwidth is during "Special Testing" and its subsequent PLO doesn't care if it gets a "weird" oscillating signal.
> Â It is not possible for an oscillation to occur if U3 is removed.
> Scotty
>
> --- On Fri, 2/11/11, radiotalk@... <chris@...> wrote:
>
> From: radiotalk@... <chris@...>
> Subject: [spectrumanalyzer] DDS Rev D issue
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, February 11, 2011, 9:36 PM
>
> Hi Scotty / Sam
>
> Looking at the output J4 with a scope, DDS non-commanded, I have a 1380Hz 50% duty cycle 5v p-p waveform. I have removed C30 and U3 (7SZ04MX4) still self oscillates, removing C31 changes the freq to 17kHz or R10 stops the oscillation. It doesn't matter if J4 is terminated (via capacitor to 50 ohms) or o/c.
>
>
> If commanded, a very short pulse width square wave appears at J2 & J3.
>
> Is this meant to occur?
>
>
> Regards
>
> Chris

7644. Re: [spectrumanalyzer] Re: DDS Rev D issue

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-12 14:41:20 UTC
From: william sprowls
Topic: 7640 Message: 7644

The nominal signal level out of the DDS crystal filter and into U3 should be about 1.2 v pk to pk., at 10.7 MHz.
Scotty

--- On Sat, 2/12/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: DDS Rev D issue
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, February 12, 2011, 8:08 AM

As Scotty said, oscillation of U3 is normal with no input coming through the 10.7 MHz filter. But once it is receiving a signal, the output should be a square wave with near 50% duty cycle, not a short pulse. Check the signal strength into and out of the filter. I don't recall what it should be, but I suspect the signal coming out of your filter is tiny, as in a few mV.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:

>

> Hi Chris,

> It possible for U3 to oscillate at this low frequency if there is no input signal to U3. This occurs when the DDS is either not commanded or if it is commanded to a frequency outside of the bandwidth of the DDS filter (10.7 MHz).

> Â For the MSA, the only time the DDS is commanded outside of its normal bandwidth is during "Special Testing" and its subsequent PLO doesn't care if it gets a "weird" oscillating signal.

> Â It is not possible for an oscillation to occur if U3 is removed.

> Scotty

>

> --- On Fri, 2/11/11, radiotalk@... <chris@...> wrote:

>

> From: radiotalk@... <chris@...>

> Subject: [spectrumanalyzer] DDS Rev D issue

> To: spectrumanalyzer@yahoogroups.com

> Date: Friday, February 11, 2011, 9:36 PM

>

> Hi Scotty / Sam

>

> Looking at the output J4 with a scope, DDS non-commanded, I have a 1380Hz 50% duty cycle 5v p-p waveform. I have removed C30 and U3 (7SZ04MX4) still self oscillates, removing C31 changes the freq to 17kHz or R10 stops the oscillation. It doesn't matter if J4 is terminated (via capacitor to 50 ohms) or o/c.

>

>

> If commanded, a very short pulse width square wave appears at J2 & J3.

>

> Is this meant to occur?

>

>

> Regards

>

> Chris

7645. Re: [spectrumanalyzer] Error found on my Rev C Control Board [1 Attachment]

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-12 17:56:13 UTC
From: Robert Fish
Topic: 7634 Message: 7645

Hi Dale,

Sorry for your trouble and lost time. I'm glad you got it resolved. I don't think that board came from my batch. I did two group orders. The first one was for crystal filter switch boards only. They shipped out in the first two weeks of May 2010. The second group buy I organized was for Full panels and various individual boards. This group would have included the Control boards. They shipped out in the last 2 weeks of June and early July 2010. My boards have no silk screen or masking and are very light green in color. There was a group of boards that went out prior to my getting involved that had via problems on other boards (The PLO board, I think) They were Blue in color , I believe.

I have two Control Boards here from the batch that I sent out and they check fine.

I hope the tone of this e-mail doesn't sound defensive. It isn't intended that way, I just want to reassure the folks that ordered my boards that every seems OK with that batch.

Once again, sorry for your difficulties and lost time. Please don't hesitate to ask if I can be of further assistance.

Bob Fish

> I recently purchased a set of boards from someone off the list. I was
> told they were from a group buy from around May of 2010. I do not have
> any other details on the boards I have other that that. They all look
> to be the latest revisions though. While testing the control board I
> had a short on the 10 volt side of the regulator on the board. I
> traced the problem down to 3 via's in the 10 volt line to the ground
> plane. I simply drilled out the via's to remove thier connection I
> have included a photo of my board and the 3 via's. I searched the
> board and could not find a reference to this. I am posting this in the
> hopes that it saves someone else the frustration of tracking this
> down. If it was posted in the past please forgive the bandwidth.
>
> Dale
>
>
>
>

7646. re: [spectrumanalyzer] Error found on my Rev C Control Board (Whoops)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-12 18:19:34 UTC
From: Robert Fish
Topic: 7634 Message: 7646

Hi Dale,

I just went to your excellent website and looked at the pictures (which I should have done before I responded). Those boards look exactly like the ones I sent out. Except mine didn't have those three extra vias on the 10 volt line (at least the two Control Boards I have here don't have them). So I'm not sure which group they were part of. Unless, there is a subset of mine that are screwed up. I sold 40 boards so there are plenty out there.

Let me know if you bought something from me that has mistakes and I will make it right.

Thanks,

Bob

> Hi Dale,
>
> Sorry for your trouble and lost time. I'm glad you got it resolved. I
> don't think that board came from my batch. I did two group orders. The
> first one was for crystal filter switch boards only. They shipped out
> in the first two weeks of May 2010. The second group buy I organized
> was for Full panels and various individual boards. This group would
> have included the Control boards. They shipped out in the last 2 weeks
> of June and early July 2010. My boards have no silk screen or masking
> and are very light green in color. There was a group of boards that
> went out prior to my getting involved that had via problems on other
> boards (The PLO board, I think) They were Blue in color , I believe.
>
> I have two Control Boards here from the batch that I sent out and they
> check fine.
>
> I hope the tone of this e-mail doesn't sound defensive. It isn't
> intended that way, I just want to reassure the folks that ordered my
> boards that every seems OK with that batch.
>
> Once again, sorry for your difficulties and lost time. Please don't
> hesitate to ask if I can be of further assistance.
>
> Bob Fish
>
>
>> I recently purchased a set of boards from someone off the list. I was
>> told they were from a group buy from around May of 2010. I do not
>> have any other details on the boards I have other that that. They all

>> look to be the latest revisions though. While testing the control
>> board I had a short on the 10 volt side of the regulator on the
>> board. I traced the problem down to 3 via's in the 10 volt line to
>> the ground plane. I simply drilled out the via's to remove thier
>> connection I have included a photo of my board and the 3 via's. I
>> searched the board and could not find a reference to this. I am
>> posting this in the hopes that it saves someone else the frustration
>> of tracking this down. If it was posted in the past please forgive
>> the bandwidth.
>>
>> Dale
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>

7647. Re: Error found on my Rev C Control Board (Whoops)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-12 23:28:34 UTC
From: inlinebeginner
Topic: 7634 Message: 7647

Bob
Those boards are what I sold to Dale around Jan 5, 2011.
I did a complete check for all the boards today (compare the drill file and the via/hole pads on PC), these 3 extra vias are the only errors on control boards, the other boards have no similar error.
The reason I got these 3 extra vias on control board is that when I converted the drill file, I used a tool that allows me to put multi via at same time according to some generated guiding holes. I forgot disabling the multi via function before I put single via. Such a mistake should have been caught with a final check, unfortunately, for some reason, I did not do such a final check for that control board. I will fix those vias for the rest of control boards.
Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, Robert Fish <rwfish@...> wrote:
>
> Hi Dale,
>
> I just went to your excellent website and looked at the pictures (which
> I should have done before I responded). Those boards look exactly like
> the ones I sent out. Except mine didn't have those three extra vias on
> the 10 volt line (at least the two Control Boards I have here don't have
> them). So I'm not sure which group they were part of. Unless, there is a
> subset of mine that are screwed up. I sold 40 boards so there are plenty
> out there.
>
> Let me know if you bought something from me that has mistakes and I will
> make it right.
>
> Thanks,
>
> Bob
>
>
> > Hi Dale,
> >
> > Sorry for your trouble and lost time. I'm glad you got it resolved. I
> > don't think that board came from my batch. I did two group orders. The
> > first one was for crystal filter switch boards only. They shipped out
> > in the first two weeks of May 2010. The second group buy I organized
> > was for Full panels and various individual boards. This group would
> > have included the Control boards. They shipped out in the last 2 weeks
> > of June and early July 2010. My boards have no silk screen or masking
> > and are very light green in color. There was a group of boards that
> > went out prior to my getting involved that had via problems on other

> > boards (The PLO board, I think) They were Blue in color , I believe.
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> > I have two Control Boards here from the batch that I sent out and they
> > check fine.
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> > I hope the tone of this e-mail doesn't sound defensive. It isn't
> > intended that way, I just want to reassure the folks that ordered my
> > boards that every seems OK with that batch.
> >
> > Once again, sorry for your difficulties and lost time. Please don't
> > hesitate to ask if I can be of further assistance.
> >
> > Bob Fish
> >
> >
> >> I recently purchased a set of boards from someone off the list. I was
> >> told they were from a group buy from around May of 2010. I do not
> >> have any other details on the boards I have other that that. They all
> >> look to be the latest revisions though. While testing the control
> >> board I had a short on the 10 volt side of the regulator on the
> >> board. I traced the problem down to 3 via's in the 10 volt line to
> >> the ground plane. I simply drilled out the via's to remove thier
> >> connection I have included a photo of my board and the 3 via's. I
> >> searched the board and could not find a reference to this. I am
> >> posting this in the hopes that it saves someone else the frustration
> >> of tracking this down. If it was posted in the past please forgive
> >> the bandwidth.
> >>
> >> Dale
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7648. GROUP BUY. Last call

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-12 23:51:24 UTC
From: jghbeta
Topic: 7648 Message: 7648

Last call to receive orders for the Filter plus board.
Closing time, Sunday February 13, 8 PM EST

Jim W1JGH

7649. Re: Error found on my Rev C Control Board (Whoops)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-12 23:59:14 UTC
From: Sam
Topic: 7634 Message: 7649

Lin,
Does all this (drill files and such) mean that you have converted all the boards to the Gerber format? If so, some people might find the Gerbers very handy. Also, when you say you will fix the extra vias for the rest of the control boards, does this mean you have several sets of boards?
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Bob
> Those boards are what I sold to Dale around Jan 5, 2011.
> I did a complete check for all the boards today (compare the drill file and the via/hole pads on PC), these 3 extra vias are the only errors on control boards, the other boards have no similar error.
> The reason I got these 3 extra vias on control board is that when I converted the drill file, I used a tool that allows me to put multi via at same time according to some generated guiding holes. I forgot disabling the multi via function before I put single via. Such a mistake should have been caught with a final check, unfortunately, for some reason, I did not do such a final check for that control board. I will fix those vias for the rest of control boards.
> Thanks
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, Robert Fish <rwfish@> wrote:
> >
> > Hi Dale,
> >
> > I just went to your excellent website and looked at the pictures (which
> > I should have done before I responded). Those boards look exactly like
> > the ones I sent out. Except mine didn't have those three extra vias on
> > the 10 volt line (at least the two Control Boards I have here don't have
> > them). So I'm not sure which group they were part of. Unless, there is a
> > subset of mine that are screwed up. I sold 40 boards so there are plenty
> > out there.
> >
> > Let me know if you bought something from me that has mistakes and I will
> > make it right.
> >
> > Thanks,
> >
> > Bob
> >
> >

7650. Re: [spectrumanalyzer] Re: Error found on my Rev C Control Board (Whoops)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-13 00:05:05 UTC
From: Robert Fish
Topic: 7634 Message: 7650

Hi Lin,

Ah, the world makes sense again.

Thanks,

Bob

> Bob
> Those boards are what I sold to Dale around Jan 5, 2011.
> I did a complete check for all the boards today (compare the drill
> file and the via/hole pads on PC), these 3 extra vias are the only
> errors on control boards, the other boards have no similar error.
> The reason I got these 3 extra vias on control board is that when I
> converted the drill file, I used a tool that allows me to put multi
> via at same time according to some generated guiding holes. I forgot
> disabling the multi via function before I put single via. Such a
> mistake should have been caught with a final check, unfortunately, for
> some reason, I did not do such a final check for that control board. I
> will fix those vias for the rest of control boards.
> Thanks
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Robert Fish <rwfish@...>
> wrote:
> >
> > Hi Dale,
> >
> > I just went to your excellent website and looked at the pictures (which
> > I should have done before I responded). Those boards look exactly like
> > the ones I sent out. Except mine didn't have those three extra vias on
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> > them). So I'm not sure which group they were part of. Unless, there
> is a
> > subset of mine that are screwed up. I sold 40 boards so there are
> plenty
> > out there.
> >
> > Let me know if you bought something from me that has mistakes and I
> will
> > make it right.
> >
> > Thanks,

> >
> > Bob
> >
> >
> > > Hi Dale,
> > >
> > > Sorry for your trouble and lost time. I'm glad you got it resolved. I
> > > don't think that board came from my batch. I did two group orders.
> The
> > > first one was for crystal filter switch boards only. They shipped out
> > > in the first two weeks of May 2010. The second group buy I organized
> > > was for Full panels and various individual boards. This group would
> > > have included the Control boards. They shipped out in the last 2
> weeks
> > > of June and early July 2010. My boards have no silk screen or masking
> > > and are very light green in color. There was a group of boards that
> > > went out prior to my getting involved that had via problems on other
> > > boards (The PLO board, I think) They were Blue in color , I believe.
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> > > I have two Control Boards here from the batch that I sent out and
> they
> > > check fine.
> > >
> > > I hope the tone of this e-mail doesn't sound defensive. It isn't
> > > intended that way, I just want to reassure the folks that ordered my
> > > boards that every seems OK with that batch.
> > >
> > > Once again, sorry for your difficulties and lost time. Please don't
> > > hesitate to ask if I can be of further assistance.
> > >
> > > Bob Fish
> > >
> > >
> > >> I recently purchased a set of boards from someone off the list. I
> was
> > >> told they were from a group buy from around May of 2010. I do not
> > >> have any other details on the boards I have other that that. They
> all
> > >> look to be the latest revisions though. While testing the control
> > >> board I had a short on the 10 volt side of the regulator on the
> > >> board. I traced the problem down to 3 via's in the 10 volt line to
> > >> the ground plane. I simply drilled out the via's to remove thier
> > >> connection I have included a photo of my board and the 3 via's. I
> > >> searched the board and could not find a reference to this. I am
> > >> posting this in the hopes that it saves someone else the frustration
> > >> of tracking this down. If it was posted in the past please forgive
> > >> the bandwidth.
> > >>
> > >> Dale
> > >>

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7651. Re: Error found on my Rev C Control Board (Whoops)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-13 01:38:22 UTC
From: inlinebeginner
Topic: 7634 Message: 7651

Sam
Yes. I used a different way to order these boards due to some misunderstanding at very beginning and I spent about 2 weeks to convert them to gerber and drill file.
Several reasons made me order more than one set of these PCBs. Yes, I have several sets at home.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Lin,
> Does all this (drill files and such) mean that you have converted all the boards to the Gerber format? If so, some people might find the Gerbers very handy. Also, when you say you will fix the extra vias for the rest of the control boards, does this mean you have several sets of boards?
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Bob
> > Those boards are what I sold to Dale around Jan 5, 2011.
> > I did a complete check for all the boards today (compare the drill file and the via/hole pads on PC), these 3 extra vias are the only errors on control boards, the other boards have no similar error.
> > The reason I got these 3 extra vias on control board is that when I converted the drill file, I used a tool that allows me to put multi via at same time according to some generated guiding holes. I forgot disabling the multi via function before I put single via. Such a mistake should have been caught with a final check, unfortunately, for some reason, I did not do such a final check for that control board. I will fix those vias for the rest of control boards.
> > Thanks
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, Robert Fish <rwfish@> wrote:
> > >
> > > Hi Dale,
> > >
> > > I just went to your excellent website and looked at the pictures (which
> > > I should have done before I responded). Those boards look exactly like
> > > the ones I sent out. Except mine didn't have those three extra vias on
> > > the 10 volt line (at least the two Control Boards I have here don't have
> > > them). So I'm not sure which group they were part of. Unless, there is a
> > > subset of mine that are screwed up. I sold 40 boards so there are plenty
> > > out there.
> > >
> > > Let me know if you bought something from me that has mistakes and I will

> > > make it right.
> > >
> > > Thanks,
> > >
> > > Bob
> > >
> > >
>

7652. Re: [spectrumanalyzer] GROUP BUY. Last call

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-13 02:06:50 UTC
From: Jurgen
Topic: 7648 Message: 7652

What is the cost of the board?
Does it include Scotty's new amplifier?

Thanks, Jurgen

On 2/12/2011 6:51 PM, jghbeta wrote:
>
> Last call to receive orders for the Filter plus board.
> Closing time, Sunday February 13, 8 PM EST
>
> Jim W1JGH
>
>

7653. Re: [spectrumanalyzer] GROUP BUY. Last call

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-13 02:37:20 UTC
From: Jim Hontoria
Topic: 7648 Message: 7653

Board is 39.25 for US, 45.25 overseas.

Scotty's amplifier uses the same board as the IF amplifier, only the components change. It is NOT included in this set. There is an amplifier by SamW with the same funcionality.

Jim W1JGH

On Sat, Feb 12, 2011 at 9:06 PM, Jurgen <khj221@...> wrote:

>
>
> What is the cost of the board?
> Does it include Scotty's new amplifier?
>
> Thanks, Jurgen
>
>
> On 2/12/2011 6:51 PM, jghbeta wrote:
>
>
>
> Last call to receive orders for the Filter plus board.
> Closing time, Sunday February 13, 8 PM EST
>
> Jim W1JGH
>
>
>

--
Jim G. Hontoria

7654. Total USD$ for complete set of PCBs for SA?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-13 08:11:58 UTC
From: ae5ew
Topic: 7654 Message: 7654

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Total USD$ for complete set of PCBs for SA?
What is the expected total parts + PCBs?
Charles AE5EW
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7655. Re: [spectrumanalyzer] Total USD$ for complete set of PCBs for SA?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-13 15:36:36 UTC
From: Jim Hontoria
Topic: 7654 Message: 7655

For the parts there is an estimate in Scotty's web page. I am NOT doing a group buy for parts.
The cost of the boards depends on the board dimensions and numberof buyers in a group buy.
It may run around 60-80 US $. If we can keep it simple, I MAY volunteer to organize a group buy for new comers.

Jim.

On Sun, Feb 13, 2011 at 3:11 AM, ae5ew <ae5ew.us@...> wrote:

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> Total USD$ for complete set of PCBs for SA?
> What is the expected total parts + PCBs?
> Charles AE5EW
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>
>

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Jim G. Hontoria

7656. Re: Total USD$ for complete set of PCBs for SA?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-13 16:41:17 UTC
From: Sam
Topic: 7654 Message: 7656

A big variable in Scotty's cost estimate was whether or not you used SMA connectors or went the direct-soldered-coax route. That was in the days when SMA connectors were expensive. Now, the Chinese imports are so cheap that there is not much motivation to do direct soldering.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
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7657. Re: Total USD$ for complete set of PCBs for SA?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-13 17:11:40 UTC
From: Sam
Topic: 7654 Message: 7657

Another thought: In the Files section there are two files called SLIM-BOM_ALL, one in text form and one as a spreadsheet, which apparently can be uploaded to Digi-Key, which would then give you the cost. You would have to take out the Mini-Circuits parts, which are about $100. The files are from 2008, so there may be a few discrepancies from the current schematics, primarily because the LMX2326 is no longer available (use ADF4118 or ADF4113(the latter requires an extra resistor)) and the original diodes are no longer available, but this would give you a decent cost estimate.

And a suggestion on the resistors: You get a substantial price break on resistors at qty 50. I suggest getting all of them in qty 50. Each will come in a single strip in a labeled plastic wrap (sometimes the label is stapled to the bag so you have to manually peel-and-stick). Cut a slot in one end, slide the strip part way out and remove the resistors you want (just drop the resistors out; do not trim off the end of the strip). Then slide the strip back in. Store the entire collection in numerical order. This is how I keep my resistors and it makes them very handy to use.

For the most common capacitors, do a similar thing but order qty 100. They will come in a rolled strip in a labeled plastic bag. Cut a slot in the bag and let the end of the roll stick out. In this case, after removing a bunch of capacitors, you can cut off the empty part of the strip but always leave a small bit of the strip extending out the slot.

Sam W.

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> > Jim G. Hontoria
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7658. GROUP: BUY: Added Scotty's RFA-1 Board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-13 18:18:08 UTC
From: jghbeta
Topic: 7658 Message: 7658

Hi all,
I have been able to add the RFA-1 board without any price change.

No more room left!

Jim W1JGH

7659. Re: GROUP BUY. Last call

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-13 18:20:24 UTC
From: jghbeta
Topic: 7648 Message: 7659

Hi Jurgen,

I was able to add the RFA-1 amplifier to the board.

Jim

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> What is the cost of the board?
> Does it include Scotty's new amplifier?
>
> Thanks, Jurgen
>
> On 2/12/2011 6:51 PM, jghbeta wrote:
> >
> > Last call to receive orders for the Filter plus board.
> > Closing time, Sunday February 13, 8 PM EST
> >
> > Jim W1JGH
> >
> >
>

7660. Re: Total USD$ for complete set of PCBs for SA?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-13 20:51:58 UTC
From: Sam
Topic: 7654 Message: 7660

I loaded the BOM to Digi-Key and replaced all the obsolete parts. I also changed some resistors and capacitors to choose cheaper alternatives. Total price without SMA connectors or Mini-Circuits parts was $252. This does not include the video filter switch, RBW filter switch or the actual final filters. Those switches were added after the BOM was created, but they don't use especially expensive parts.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
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> > > Jim G. Hontoria
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7661. Re: [spectrumanalyzer] Re: Total USD$ for complete set of PCBs for SA?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-13 21:03:00 UTC
From: Eric Nystrom
Topic: 7654 Message: 7661

Sam,

Could you put a spreadsheet of your Digi-Key BOM in the files section? I think Digi-Key makes it
easy to export one. It would be a big help.

Eric Nystrom

From: Sam <swetterlin@comcast.net>
To: spectrumanalyzer@yahoogroups.com
Sent: Sun, February 13, 2011 3:51:58 PM
Subject: [spectrumanalyzer] Re: Total USD$ for complete set of PCBs for SA?

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>LMX2326 is no longer available (use ADF4118 or ADF4113(the latter requires an
>extra resistor)) and the original diodes are no longer available, but this would
>give you a decent cost estimate.
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7662. Re: Total USD$ for complete set of PCBs for SA?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-13 22:23:50 UTC
From: Sam
Topic: 7654 Message: 7662

Done:

http://groups.yahoo.com/group/spectrumanalyzer/files/MSA%20BOM/MSA_BOM_2_13_11.xls

I don't guarantee that nothing is left out, but using this should get you 99%-100% of what you need. To order from Digi-Key, you can create an order per the instructions in the file.

When I created the order, everything worked except the MMUN2211 transistor was out of stock. There are a bunch of MMUN22xx biased transistors, and I'm not sure it makes much difference which you use. I think MMUN2214 would be good, and it is in stock.

I substituted the AD9851 for the AD9850, the ADF4118 for the LMX2326, and the ZLLS400TA for the MBRX... diode. For the 10uF caps, I used only ceramic; one type (25V) for the spots that deal with the 20V supply (the voltage doubler and parts of PLO1 and 3), and a cheaper one for the lower voltage spots. If that's confusing, just order all of them as the 25V type.

A few other substitutions were made. Some were because non-ROHS parts are no longer available. There were dramatic price variations for capacitors, and I generally went for the cheapest as long as it was a quality type (NP0 for those up to 1nF; X5R or X7R above that) and a brand-name supplier (Murata, TDK, Panasonic, Yageo). The resistors are available from Stackpole for about 60% the cost of those from ROHM in the original BOM, but for some reason they struck me as suspicious so I stuck with the ROHM.

Enjoy.

Sam W.

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> Sent: Sun, February 13, 2011 3:51:58 PM
> Subject: [spectrumanalyzer] Re: Total USD$ for complete set of PCBs for SA?
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7663. Re: Total USD$ for complete set of PCBs for SA?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-13 23:52:42 UTC
From: Dale
Topic: 7654 Message: 7663

I also built a spread sheet that is broke down by module and has totals. I know the voltage regulators have the wrong count, I have not completed building yet so do not know how accurate the rest of it is. I put it on my web page, for those that are interested.

http://wentztech.com/radio/SpectrumAnalyser/SA.html

I have placed 3 orders with digikey for about $262.00. One of the orders has SMD solder and some other supplies on it. I have also spent about 100.00 on ebay for connectors, coax, etc, Plus the 100.00 from mini circuits, $60.00 for the boards. I think I now have all the parts needed to build my SA. That puts me at $522.00 So far. I would say that is a good number, not counting supplies for shielding, the cavity filters, and a case, all of which I already had on hand. I did have some of the Analog devices on hand like the DDS and Analog to digital converters.

I have also been collecting notes on the boards for the group buy that is going on if anyone is interested. Thought it would be easier if all the info was in one place, when I started using them.

Dale

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Done:
>
> http://groups.yahoo.com/group/spectrumanalyzer/files/MSA%20BOM/MSA_BOM_2_13_11.xls
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> > Subject: [spectrumanalyzer] Re: Total USD$ for complete set of PCBs for SA?
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7664. Re: GROUP BUY. Last call

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-14 00:41:13 UTC
From: wb4jfi
Topic: 7648 Message: 7664

I would like to add my name/call to the boardset order.
Terry Fox, WB4JFI

I hope that I'm not too late. I sent a message directly, but my email computer (or my ISP...) seems to be having problems right now. Sorry for the bandwidth here, I am deep into troubleshooting...
Terry

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> Hi Jurgen,
>
> I was able to add the RFA-1 amplifier to the board.
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> Jim
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> --- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@> wrote:
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> > What is the cost of the board?
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> > Thanks, Jurgen
> >
> > On 2/12/2011 6:51 PM, jghbeta wrote:
> > >
> > > Last call to receive orders for the Filter plus board.
> > > Closing time, Sunday February 13, 8 PM EST
> > >
> > > Jim W1JGH
> > >
> > >
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>

7665. Re: [spectrumanalyzer] Re: GROUP BUY. Last call

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-14 00:58:26 UTC
From: Jim Hontoria
Topic: 7648 Message: 7665

TIME EXTENSION
Closing is delayed by 1 hour to 9PM EST
There are some stragglers trying to make it to the finish line.

Jim W1JGH

7666. MMUN2211 substitute?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-14 16:19:07 UTC
From: pzerkel
Topic: 7666 Message: 7666

Digikey is out of stock on the MMUN2211. Would the DDTC114ECA-FDICT-ND be an acceptable substitute?

Looks like the difference in specs is this part lists a frequency transition of 250MHz, but 2211 has no frequency listed.

Thanks

7667. Re: MMUN2211 substitute?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-14 17:31:33 UTC
From: Dale
Topic: 7666 Message: 7667

--- In spectrumanalyzer@yahoogroups.com, "pzerkel" <pzerkel@...> wrote:
>
> Digikey is out of stock on the MMUN2211. Would the DDTC114ECA-FDICT-ND be an acceptable substitute?
>
> Looks like the difference in specs is this part lists a frequency transition of 250MHz, but 2211 has no frequency listed.
>
> Thanks
>

Thats what I orderd in place of the MMUN2211 for my build.

Dale

7668. Re: [spectrumanalyzer] Re: MMUN2211 substitute?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-14 18:19:29 UTC
From: william sprowls
Topic: 7666 Message: 7668

Hi All,
In response to this substitution, I need to provide some information about the MMUN2211 device.
 It is used in the AtoD circuit output to drive the lines back to the computer. The AtoD chip can supply only 500 ua of current, not near enough to drive the computer, but more than enough to drive the MMUN2211.
  The MMUN2211 acts as an inverter buffer. By theory, there is very little delay from the input of the MMUN2211 to the output of the MMUN2211.
 But, here is what I found. When the AtoD sends a high level signal (+5v) to the input of the MMUN2211, the output of the MMUN2211 goes low (0v) within 50 nsec. This is proper and acknowledged by the people at ON Semi (Motorola).
   When the AtoD sends a low level signal (0v) to the input of the MMUN2211, it takes the output of the MMUN2211 to go high (5v) by more than 1.2 usec. This is 24 times the delay time acknowledged by the people at ON Semi (Motorola). Their support to me sucked.
 This test is repeatable in 4 devices by 3 builders. From an engineering view, this is usually a result of base current saturation in a transistor. However, the MMUN2211 has a 10 K series resistor and 10 K shunt resistor that should limit base current to less than 380 ua. We don't usually see this kind of problem with this low of a base current.
 The MMUN2214 has a 10 K series resistor and 47 K shunt resistor that should limit base current to less than 427 ua. This is a bit more than the MMUN2211 and this problem could possibly be worse when using the MMUN2214.
 I would ask anyone trying this device to make some timing tests once it is installed in the AtoD module. It is very possible that ON has mismarked the MMUN2211 device and that the MMUN2214 will work quite well.
 This problem didn't create any grief until David began integrating USB. His USB bus inputs are very fast and his system was "missing" pulses. He "fixed" the condition by slowing down the bus when taking serial data from the AtoD module. This allowed the MMUN2211 to "settle" before its output was read.
Scotty
Scotty

--- On Mon, 2/14/11, Dale <kb9jja@...> wrote:

From: Dale <kb9jja@gmail.com>
Subject: [spectrumanalyzer] Re: MMUN2211 substitute?
To: spectrumanalyzer@yahoogroups.com
Date: Monday, February 14, 2011, 11:31 AM

--- In spectrumanalyzer@yahoogroups.com, "pzerkel" <pzerkel@...> wrote:

>

> Digikey is out of stock on the MMUN2211. Would the DDTC114ECA-FDICT-ND be an acceptable substitute?

>

> Looks like the difference in specs is this part lists a frequency transition of 250MHz, but 2211 has no frequency listed.

>

> Thanks

>

Thats what I orderd in place of the MMUN2211 for my build.

Dale

8:00? 8:25? 8:40? Find a flick in no time
with the Yahoo! Search movie showtime shortcut.
http://tools.search.yahoo.com/shortcuts/#news

7669. Re: MMUN2211 substitute?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-14 19:01:53 UTC
From: inlinebeginner
Topic: 7666 Message: 7669

Scotty
Looks like you need a push-pull output on that driver, instead of a OC.
The wire from A/D board to control board has inductance and capacitance, if the cap is driven by a 2.2k ohm from 5V, it might be slow charging, and create a slow rising edge. If a push-pull could be very fast (about 65 ohm or less, depends up on the driver capability of the IC).
Lin

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi All,
> In response to this substitution, I need to provide some information about the MMUN2211 device.
> Â It is used in the AtoD circuit output to drive the lines back to the computer. The AtoD chip can supply only 500 ua of current, not near enough to drive the computer, but more than enough to drive the MMUN2211.
> Â The MMUN2211 acts as an inverter buffer. By theory, there is very little delay from the input of the MMUN2211 to the output of the MMUN2211.
> Â But, here is what I found. When the AtoD sends a high level signal (+5v) to the input of the MMUN2211, the output of the MMUN2211 goes low (0v) within 50 nsec. This is proper and acknowledged by the people at ON Semi (Motorola).
> Â Â When the AtoD sends a low level signal (0v) to the input of the
> MMUN2211, it takes the output of the MMUN2211 to go high (5v) by more than 1.2 usec. This
> is 24 times the delay time acknowledged by the people at ON Semi (Motorola). Their support to me sucked.
> Â This test is repeatable in 4 devices by 3 builders. From an engineering view, this is usually a result of base current saturation in a transistor. However, the MMUN2211 has a 10 K series resistor and 10 K shunt resistor that should limit base current to less than 380 ua. We don't usually see this kind of problem with this low of a base current.
> Â The MMUN2214 has a 10 K series resistor and 47 K shunt resistor that should limit base current to less than 427 ua. This is a bit more than the MMUN2211 and this problem could possibly be worse when using the MMUN2214.
> Â I would ask anyone trying this device to make some timing tests once it is installed in the AtoD module. It is very possible that ON has mismarked the MMUN2211 device and that the MMUN2214 will work quite well.
> Â This problem didn't create any grief until David began integrating USB. His USB bus inputs are very fast and his system was "missing" pulses. He "fixed" the condition by slowing down the bus when taking serial data from the AtoD module. This allowed the MMUN2211 to "settle" before its output was read.
> Scotty
> Scotty
>
> --- On Mon, 2/14/11, Dale <kb9jja@...> wrote:
>
> From: Dale <kb9jja@...>

> Subject: [spectrumanalyzer] Re: MMUN2211 substitute?
> To: spectrumanalyzer@yahoogroups.com
> Date: Monday, February 14, 2011, 11:31 AM
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> --- In spectrumanalyzer@yahoogroups.com, "pzerkel" <pzerkel@> wrote:
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> > Digikey is out of stock on the MMUN2211. Would the DDTC114ECA-FDICT-ND be an acceptable substitute?
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>
> > Looks like the difference in specs is this part lists a frequency transition of 250MHz, but 2211 has no frequency listed.
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> > Thanks
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> Thats what I orderd in place of the MMUN2211 for my build.
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> Dale
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> _____
> 8:00? 8:25? 8:40? Find a flick in no time
> with the Yahoo! Search movie showtime shortcut.
> http://tools.search.yahoo.com/shortcuts/#news
>

7670. Re: Searching for LMX2326 chips

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-14 22:22:01 UTC
From: Dale
Topic: 7624 Message: 7670

I have both the LMX2326 as well as the ADF4118's on hand. As I have both is one better than the other?

Dale

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> Hello,
>
> I would like to buy 3 x LMX2326.
> So far I have been unable to find a source.
> Is there a replacement part?
>
> Thanks, Jurgen
>

7671. Re: Liberty Basic Purchase Problem

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-14 22:49:17 UTC
From: nealmartini
Topic: 7569 Message: 7671

Scotty and Sam and All,

Unfortunately, I still haven't received a Liberty Basic Code Key or a CD. I sent an email to the support line but did not receive a response. Recall that I left three voicemail messages earlier and did not get a callback or response. Also, my credit card was immediately charged.

I tried to find a direct email for Carl Gundel (author of Liberty Basic), but was able to locate it. If anyone has his email address, please let me know.

I am continuing to post the status here so others might approach ordering their own Liberty Basic with some caution. Maybe the online link isn't the best way to go.

Any further suggestions are welcomed.

Neal

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Neal,
> The owner of Liberty Basic is Carl Gunter (or Gunther). Normally, you would download the free version from their website and when they get a payment, they supply you with the Code Key. This Key just unlocks the same code into full use. I never messed with the CD. But, I'm guessing you would get it in the snail mail, along with the Code Key.
> Â I suggest you email their support address, and tell Carl you are unhappy.
> BTW, the executable for the new Beta is in the Files Section of our Group.
> Scotty
>
>
> --- On Fri, 2/4/11, nealmartini <nealmartini@...> wrote:
>
> From: nealmartini <nealmartini@...>
> Subject: [spectrumanalyzer] Liberty Basic Purchase Problem
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, February 4, 2011, 8:53 PM
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> All,
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> Three weeks ago I decided to break down and purchase Liberty Basic so I could try out the latest Beta upgrade for the MSA software. Before that I was just using the latest executable so I did not have to use the Liberty Basic program to compile.
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>
> I followed the links that come up when you try and start the Liberty Basic Trial Copy and went through the process of ordering Liberty Basic for $59 and added the option of a $10 CD version.
>
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>
> To date I have not received anything. The website said I would get an email telling me how to download Liberty Basic, but I never did. I thought maybe they were going to send the CD since I selected that option, but I never received anything.
>
>
>
> I also called the telephone number listed in the pop up and was only able to leave messages. I did not receive any return calls. Incidentally, my credit card was charged with the $69 the day after I placed the order.
>
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>
> Does anyone know the person who supplies Liberty Basic? Has anyone been successful in ordering from the pop up that comes up when you start the trial version of Liberty Basic? Any other suggestions?
>
>
>
> Help
>
> Neal
>

7672. Re: Liberty Basic Purchase Problem

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-14 23:08:53 UTC
From: Sam
Topic: 7569 Message: 7672

Neal,
I posted a message on the Yahoo LB site. I'll let you know if I get any info.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> Scotty and Sam and All,
>
> Unfortunately, I still haven't received a Liberty Basic Code Key or a CD. I sent an email to the support line but did not receive a response. Recall that I left three voicemail messages earlier and did not get a callback or response. Also, my credit card was immediately charged.
>
> I tried to find a direct email for Carl Gundel (author of Liberty Basic), but was able to locate it. If anyone has his email address, please let me know.
>
> I am continuing to post the status here so others might approach ordering their own Liberty Basic with some caution. Maybe the online link isn't the best way to go.
>
> Any further suggestions are welcomed.
>
> Neal
>
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> >
> > Hi Neal,
> > The owner of Liberty Basic is Carl Gunter (or Gunther). Normally, you would download the free version from their website and when they get a payment, they supply you with the Code Key. This Key just unlocks the same code into full use. I never messed with the CD. But, I'm guessing you would get it in the snail mail, along with the Code Key.
> > Â I suggest you email their support address, and tell Carl you are unhappy.
> > BTW, the executable for the new Beta is in the Files Section of our Group.
> > Scotty
> >
> >
> > --- On Fri, 2/4/11, nealmartini <nealmartini@> wrote:
> >
> > From: nealmartini <nealmartini@>
> > Subject: [spectrumanalyzer] Liberty Basic Purchase Problem
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Friday, February 4, 2011, 8:53 PM
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> > I also called the telephone number listed in the pop up and was only able to leave messages. I did not receive any return calls. Incidentally, my credit card was charged with the $69 the day after I placed the order.
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> >
> > Does anyone know the person who supplies Liberty Basic? Has anyone been successful in ordering from the pop up that comes up when you start the trial version of Liberty Basic? Any other suggestions?
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> >
> > Help
> >

> > Neal
> >
>

7673. Re: Searching for LMX2326 chips

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-14 23:09:51 UTC
From: Sam
Topic: 7624 Message: 7673

As I recall, the ADF has somewhat better specs. Maybe that is why the LMX2326 was discontinued.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Dale" <kb9jja@...> wrote:
>
> I have both the LMX2326 as well as the ADF4118's on hand. As I have both is one better than the other?
>
> Dale
>
>
> --- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@> wrote:
> >
> > Hello,
> >
> > I would like to buy 3 x LMX2326.
> > So far I have been unable to find a source.
> > Is there a replacement part?
> >
> > Thanks, Jurgen
> >
>

7674. Re: Liberty Basic Purchase Problem

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-15 16:37:03 UTC
From: nealmartini
Topic: 7569 Message: 7674

Sam,

Thank you so much for your help on this. I did receive an email response from Carl telling me how to unlock the trial version of VB.

Neal

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Neal,
> I posted a message on the Yahoo LB site. I'll let you know if I get any info.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@> wrote:
> >
> > Scotty and Sam and All,
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> > Unfortunately, I still haven't received a Liberty Basic Code Key or a CD. I sent an email to the support line but did not receive a response. Recall that I left three voicemail messages earlier and did not get a callback or response. Also, my credit card was immediately charged.
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> > I am continuing to post the status here so others might approach ordering their own Liberty Basic with some caution. Maybe the online link isn't the best way to go.
> >
> > Any further suggestions are welcomed.
> >
> > Neal
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > >
> > > Hi Neal,
> > > The owner of Liberty Basic is Carl Gunter (or Gunther). Normally, you would download the free version from their website and when they get a payment, they supply you with the Code Key. This Key just unlocks the same code into full use. I never messed with the CD. But, I'm guessing you would get it in the snail mail, along with the Code Key.
> > > Â I suggest you email their support address, and tell Carl you are unhappy.
> > > BTW, the executable for the new Beta is in the Files Section of our Group.
> > > Scotty
> > >
> > >
> > > --- On Fri, 2/4/11, nealmartini <nealmartini@> wrote:

> > >
> > > From: nealmartini <nealmartini@>
> > > Subject: [spectrumanalyzer] Liberty Basic Purchase Problem
> > > To: spectrumanalyzer@yahoogroups.com
> > > Date: Friday, February 4, 2011, 8:53 PM
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> > > I followed the links that come up when you try and start the Liberty Basic Trial Copy and went through the process of ordering Liberty Basic for $59 and added the option of a $10 CD version.
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> > > To date I have not received anything. The website said I would get an email telling me how to download Liberty Basic, but I never did. I thought maybe they were going to send the CD since I selected that option, but I never received anything.
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> > >
> > >
> > > I also called the telephone number listed in the pop up and was only able to leave messages. I did not receive any return calls. Incidentally, my credit card was charged with the $69 the day after I placed the order.
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> > >

> > > Does anyone know the person who supplies Liberty Basic? Has anyone been successful in ordering from the pop up that comes up when you start the trial version of Liberty Basic? Any other suggestions?
> > >
> > >
> > >
> > > Help
> > >
> > > Neal
> > >
> >
>

7675. Phase noise pedestal

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-16 00:46:04 UTC
From: motorol9
Topic: 7675 Message: 7675

Hi

Have linked to 2 photo's to get comparisons to the phase noise pedestal I am seeing on the spec analyzer. Would be interested in comparisons to other spec analyzers to see if I have some additional problems.

Both screen shots are at 100Mhz using 300Khz and 1Mhz sweep width.

The signal source is a low noise HP signal generator.

Pic 1.

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/773230570/pic/1281347871/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

Pic 2.
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/773230570/pic/42863583/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

As a test I removed the 20 volt supply from the control board and used a Tektronix variable supply to run the 20 volt line. There was no difference in the data displayed so I think the 20 volt supply is clean (Cannot see any noticable ripple on a CRO)

Thanks

Rex

7676. FLITER GROUP BUY: UPDATE

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-16 12:22:05 UTC
From: jghbeta
Topic: 7676 Message: 7676

Order was placed with ExpressPCB and expect delivery on Feb 21. I'll be mailing within that week. The mailing boxes and bubbles are ready.

Attached is a pdf document with the final board layout and location guide. You will need the later to quickly identify the individual PCBs.

Jim W1JGH

7677. Re: [spectrumanalyzer] FLITER GROUP BUY: UPDATE

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-16 12:34:58 UTC
From: Jim Hontoria
Topic: 7676 Message: 7677
Attachments: 1 described; binary payloads are missing from this source WARC

OOps. File attached here.
Jim

On Wed, Feb 16, 2011 at 7:22 AM, jghbeta <jghalpha@...> wrote:

>
>
> Order was placed with ExpressPCB and expect delivery on Feb 21. I'll be
> mailing within that week. The mailing boxes and bubbles are ready.
>
> Attached is a pdf document with the final board layout and location guide.
> You will need the later to quickly identify the individual PCBs.
>
> Jim W1JGH
>
>
>

--
Jim G. Hontoria

7678. Re: [spectrumanalyzer] Phase noise pedestal

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-16 13:17:30 UTC
From: william sprowls
Topic: 7675 Message: 7678

Hi Rex,
Both pics look outstanding. Just exactly what I would expect to see with a wide resolution filter such as your 18 KHz one.
 You didn't say that you had done Magnitude calibration. Either way, the phase noise ratio is within 2 dB of a theoretical.
Scotty

--- On Tue, 2/15/11, motorol9 <r.pearson@...> wrote:

From: motorol9 <r.pearson@....net>
Subject: [spectrumanalyzer] Phase noise pedestal
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, February 15, 2011, 6:46 PM

Hi

Have linked to 2 photo's to get comparisons to the phase noise pedestal I am seeing on the spec analyzer. Would be interested in comparisons to other spec analyzers to see if I have some additional problems.

Both screen shots are at 100Mhz using 300Khz and 1Mhz sweep width.

The signal source is a low noise HP signal generator.

Pic 1.

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/773230570/pic/1281347871/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

Pic 2.

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/773230570/pic/42863583/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

As a test I removed the 20 volt supply from the control board and used a Tektronix variable supply to run the 20 volt line. There was no difference in the data displayed so I think the 20 volt supply is clean (Cannot see any noticable ripple on a CRO)

Thanks

Rex

7679. Re: Phase noise pedestal

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-16 21:35:19 UTC
From: motorol9
Topic: 7675 Message: 7679

Hi Scotty

Thanks for the info. I have done the mag cals for the filter from 0dBm to -120dBm.

Rex

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Rex,
> Both pics look outstanding. Just exactly what I would expect to see with a wide resolution filter such as your 18 KHz one.
> Â You didn't say that you had done Magnitude calibration. Either way, the phase noise ratio is within 2 dB of a theoretical.
> Scotty
>
> --- On Tue, 2/15/11, motorol9 <r.pearson@...> wrote:
>
> From: motorol9 <r.pearson@...>
> Subject: [spectrumanalyzer] Phase noise pedestal
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, February 15, 2011, 6:46 PM
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>

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> Both screen shots are at 100Mhz using 300Khz and 1Mhz sweep width.
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> Pic 1.
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> As a test I removed the 20 volt supply from the control board and used a Tektronix variable supply to run the 20 volt line. There was no difference in the data displayed so I think the 20 volt supply is clean (Cannot see any noticable ripple on a CRO)
>
>
>
> Thanks
>
>
>
> Rex
>

7680. Filter Group Buy Info

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-17 00:20:48 UTC
From: Dale
Topic: 7680 Message: 7680

All,

For those of you that have partaken in Jim's group buy of the filter plus boards.

I started collecting info on the boards included in the group by. Most notably documentation that Jim Provided, Scotty's and Sam's web sites, as well as postings on the list reflector. I thought that some of you might also be interested in the info so I decided to make it a web page instead of a word document for my note book!

It is located at http://wentztech.com/radio/SpectrumAnalyser/SA/FilterPlus.html

73 de KB9JJA/Dale

7681. Re: [spectrumanalyzer] Filter Group Buy Info

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-17 00:53:01 UTC
From: william sprowls
Topic: 7680 Message: 7681

Dale,
 Just to prove I really do read everyone's web pages, yours states, plus a few other boards for use with the SMA.

I have designed the most expensive SMA in history! Hehe.
  I'm just poking some fun, as I have made this finger fumble hundreds of times.
Good page!
Scotty

--- On Wed, 2/16/11, Dale <kb9jja@...> wrote:

From: Dale <kb9jja@...>
Subject: [spectrumanalyzer] Filter Group Buy Info
To: spectrumanalyzer@yahoogroups.com
Date: Wednesday, February 16, 2011, 6:20 PM

All,

For those of you that have partaken in Jim's group buy of the filter plus boards.

I started collecting info on the boards included in the group by. Most notably documentation that Jim Provided, Scotty's and Sam's web sites, as well as postings on the list reflector. I thought that some of you might also be interested in the info so I decided to make it a web page instead of a word document for my note book!

It is located at http://wentztech.com/radio/SpectrumAnalyser/SA/FilterPlus.html

73 de KB9JJA/Dale

7682. Re: Filter Group Buy Info

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-17 01:43:21 UTC
From: dalewentz
Topic: 7680 Message: 7682

Scotty,

Yes I have done that more than one time in the last few days :-)

I have to go to the store and get some more white out, I have gone through two bottles already this week, and the web page still is not done!

I just fixed it, but I am sure you will see it again on one of my pages, in the near future!

Dale

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Dale,
> Â Just to prove I really do read everyone's web pages, yours states, plus a few other boards for use with the SMA.
>
> I have designed the most expensive SMA in history! Hehe.
> Â I'm just poking some fun, as I have made this finger fumble hundreds of times.
> Good page!
> Scotty
>
> --- On Wed, 2/16/11, Dale <kb9jja@...> wrote:
>
> From: Dale <kb9jja@...>
> Subject: [spectrumanalyzer] Filter Group Buy Info
> To: spectrumanalyzer@yahoogroups.com
> Date: Wednesday, February 16, 2011, 6:20 PM
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> All,
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> For those of you that have partaken in Jim's group buy of the filter plus boards.
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>
>
>
> It is located at http://wentztech.com/radio/SpectrumAnalyser/SA/FilterPlus.html
>
>
>
> 73 de KB9JJA/Dale
>

7683. Mixer fences

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-17 08:38:53 UTC
From: davidhooau
Topic: 7683 Message: 7683

Folks,

Should one fit fences around the R port on mixers 3 and 4?

davidh

7684. Re: Mixer fences

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-17 15:23:09 UTC
From: Sam
Topic: 7683 Message: 7684

I experimented with fencing in Mixer 3 and could not detect any effect. That was a while ago. I don't recall the details but I recall concluding that to make the attenuation of the RF line fully effective, it might help to use a canned attenuator external to the mixer (never tried that, though). But I also have more than the normal attenuation, because I added an amplifier on the output, which provides a little gain but mainly improves the TG return loss and prevents high frequency reflections from the DUT back to Mixer 3.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Folks,
>
> Should one fit fences around the R port on mixers 3 and 4?
>
> davidh
>

7685. Re: [spectrumanalyzer] Mixer fences

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-17 17:03:44 UTC
From: william sprowls
Topic: 7683 Message: 7685

Hi David,
 No, a waste of time. Fencing usually improves isolation, but the internal isolation of the mixer is the contributor, not the connectors. Just make sure the J1-J3 connections have their center conductosr clipped flush to the board, or as short as possible. This is just good general construction practice when working at UHF.
Scotty

--- On Thu, 2/17/11, davidhooau <dhooke@...> wrote:

From: davidhooau <dhooke@...>
Subject: [spectrumanalyzer] Mixer fences
To: spectrumanalyzer@yahoogroups.com
Date: Thursday, February 17, 2011, 2:38 AM

Folks,

Should one fit fences around the R port on mixers 3 and 4?

davidh

7686. Re: [spectrumanalyzer] Mixer fences

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-17 19:00:34 UTC
From: Robert Fish
Topic: 7683 Message: 7686

Oh, give me land, lots of land, under starry skies above
Don't fence me in
Let me ride thru the wide-open country that I love
Don't fence me in
Let me be by myself in the evening breeze
Listen to the murmur of the cottonwood trees
Send me off forever, but I ask you please
Don't fence me in
Don't fence me in

I couldn't help it, so shoot me

Bob

> Hi David,
> No, a waste of time. Fencing usually improves isolation, but the
> internal isolation of the mixer is the contributor, not the
> connectors. Just make sure the J1-J3 connections have their center
> conductosr clipped flush to the board, or as short as possible. This
> is just good general construction practice when working at UHF.
> Scotty
>
> --- On *Thu, 2/17/11, davidhooau /<dhooke@...>/* wrote:
>
>
> From: davidhooau <dhooke@...>
> Subject: [spectrumanalyzer] Mixer fences
> To: spectrumanalyzer@yahoogroups.com
> Date: Thursday, February 17, 2011, 2:38 AM
>
> Folks,
>
> Should one fit fences around the R port on mixers 3 and 4?
>
> davidh
>
>
>

7687. ADC Testing Oddness

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-18 06:17:32 UTC
From: Dale
Topic: 7687 Message: 7687

I was testing my 16 bit ADC board. The mag side seems to react to the volt meter test quickly. When I test the Phase side it moves very very slow. I never let it get to 0 volts, I quit after about 15 min and it was still not there. I have tested everything even replaced the transistor. Ohms and voltage measurements seem good comparing the two. I originally had some parts that moved around on the board that I did not catch, and thought I damaged U3, but I replaced it. It is acting differently, by being very slow, but not the same as U2. I also noticed that the trace is not level when the switch is in the center position for the phase setting.

Anyone have anything that can point me in the correct direction?

Dale

7688. Re: ADC Testing Oddness

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-18 13:27:07 UTC
From: Sam
Topic: 7687 Message: 7688

What was the actual non-zero voltage reading? What phase did the trace display?
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Dale" <kb9jja@...> wrote:
>
> I was testing my 16 bit ADC board. The mag side seems to react to the volt meter test quickly. When I test the Phase side it moves very very slow. I never let it get to 0 volts, I quit after about 15 min and it was still not there. I have tested everything even replaced the transistor. Ohms and voltage measurements seem good comparing the two. I originally had some parts that moved around on the board that I did not catch, and thought I damaged U3, but I replaced it. It is acting differently, by being very slow, but not the same as U2. I also noticed that the trace is not level when the switch is in the center position for the phase setting.
>
> Anyone have anything that can point me in the correct direction?
>
>
> Dale
>

7689. GROUP BUY Boards Arrived

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-19 01:12:49 UTC
From: jghbeta
Topic: 7689 Message: 7689

I just received the boards from ExpressPCB. That is almost 5 days ahead of schedule. I'll start packing during this weekend.

Jim W1JGH

7690. PLO3 tests in "test as you build"

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-19 09:37:04 UTC
From: davidhooau
Topic: 7690 Message: 7690

Oh Wise Ones,

I'm following the "test as you build" guide. All works fine for checking PLO2 and PLO1 (except my all mixers are missing about 2dB).

To get any sensible results for PLO3 I have to change mode to "SA with TG" and change the centre frequency to 10.7MHz to get any signal into the crystal filter. This matches my understanding of how things should work, as the TG output is the difference between PLO2 and PLO3.

Is this a documentation shortfall, or am I overlooking something obvious?

I'm using Ver 115, Rev G.

Thanks!

davidh

7691. Re: ADC Testing Oddness

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-19 12:37:04 UTC
From: Dale
Topic: 7687 Message: 7691

Sam,

I went back and tested a bit more yesterday. I now have the phase ADC just about matching the Mag ADC. The difference I am seeing I think is due to the cap that goes from the input of the ADC to ground. They did not measure the same in circuit with my AADE cap meter. I also cleaned the board again real well and that seemed to help also. Even though my ohm meter showed close to the same reading when testing, I am guessing there was some gunk hidden under something that was causing the volt meter test that feeds a voltage to the ADC to be off. Once I cleaned everything the oddness with the switch in the center position went away also. If I short the Phase and Mag inputs together the numbers are almost identical, and they fall off at a very close rate now.

Dale

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> What was the actual non-zero voltage reading? What phase did the trace display?
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "Dale" <kb9jja@> wrote:
> >
> > I was testing my 16 bit ADC board. The mag side seems to react to the volt meter test quickly. When I test the Phase side it moves very very slow. I never let it get to 0 volts, I quit after about 15 min and it was still not there. I have tested everything even replaced the transistor. Ohms and voltage measurements seem good comparing the two. I originally had some parts that moved around on the board that I did not catch, and thought I damaged U3, but I replaced it. It is acting differently, by being very slow, but not the same as U2. I also noticed that the trace is not level when the switch is in the center position for the phase setting.
> >
> > Anyone have anything that can point me in the correct direction?
> >
> >
> > Dale
> >
>

7692. Re: ADC Testing Oddness

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-19 15:52:32 UTC
From: Sam
Topic: 7687 Message: 7692

I assume the fact that you get a positive voltage reading that drops off, means the capacitor charges due to some board leakage (or IC leakage) and then discharges slowly through your voltmeter. If the capacitor itself has very low leakage, even a miniscule amount of leakage could charge it when there is no input attached. This might be another reason to attach a 10k resistor from input to ground before testing the voltage. This would more closely match how the input would function in the completed MSA.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Dale" <kb9jja@...> wrote:
>
> Sam,
>
> I went back and tested a bit more yesterday. I now have the phase ADC just about matching the Mag ADC. The difference I am seeing I think is due to the cap that goes from the input of the ADC to ground. They did not measure the same in circuit with my AADE cap meter. I also cleaned the board again real well and that seemed to help also. Even though my ohm meter showed close to the same reading when testing, I am guessing there was some gunk hidden under something that was causing the volt meter test that feeds a voltage to the ADC to be off. Once I cleaned everything the oddness with the switch in the center position went away also. If I short the Phase and Mag inputs together the numbers are almost identical, and they fall off at a very close rate now.
>
> Dale
>
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > What was the actual non-zero voltage reading? What phase did the trace display?
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Dale" <kb9jja@> wrote:
> > >
> > > I was testing my 16 bit ADC board. The mag side seems to react to the volt meter test quickly. When I test the Phase side it moves very very slow. I never let it get to 0 volts, I quit after about 15 min and it was still not there. I have tested everything even replaced the transistor. Ohms and voltage measurements seem good comparing the two. I originally had some parts that moved around on the board that I did not catch, and thought I damaged U3, but I replaced it. It is acting differently, by being very slow, but not the same as U2. I also noticed that the trace is not level when the switch is in the center position for the phase setting.
> > >
> > > Anyone have anything that can point me in the correct direction?
> > >
> > >
> > > Dale

> > >
> >
>

7693. Re: ADC Testing Oddness

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-19 16:05:20 UTC
From: Greg Broburg
Topic: 7687 Message: 7693

Warning about some AD converters is that they may
draw significant input current during the conversion
process. This is the current that is used in the
charge balancing sequence and in general is solved
with low Z drive to the AD input.

Greg

On 2/19/2011 9:52 AM, Sam wrote:
>
> I assume the fact that you get a positive voltage reading that drops
> off, means the capacitor charges due to some board leakage (or IC
> leakage) and then discharges slowly through your voltmeter. If the
> capacitor itself has very low leakage, even a miniscule amount of
> leakage could charge it when there is no input attached. This might be
> another reason to attach a 10k resistor from input to ground before
> testing the voltage. This would more closely match how the input would
> function in the completed MSA.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Dale" <kb9jja@...> wrote:
> >
> > Sam,
> >
> > I went back and tested a bit more yesterday. I now have the phase
> ADC just about matching the Mag ADC. The difference I am seeing I
> think is due to the cap that goes from the input of the ADC to ground.
> They did not measure the same in circuit with my AADE cap meter. I
> also cleaned the board again real well and that seemed to help also.
> Even though my ohm meter showed close to the same reading when
> testing, I am guessing there was some gunk hidden under something that
> was causing the volt meter test that feeds a voltage to the ADC to be
> off. Once I cleaned everything the oddness with the switch in the
> center position went away also. If I short the Phase and Mag inputs
> together the numbers are almost identical, and they fall off at a very
> close rate now.
> >
> > Dale
>

7694. Re: PLO3 tests in "test as you build"

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-19 16:11:21 UTC
From: Sam
Topic: 7690 Message: 7694

I think you are right. The procedure states that PLO3 will automatically be commanded to 1034 MHz, which is where it would be with the default signal generator frequency of 10 MHz. But that frequency won't get through the filter. You don't have to change modes, you just have to set the SG frequency to 10.7 MHz. The SG is exactly the same as the TG, except SG is available in Spectrum Analyzer mode and stays at a fixed frequency, so once you set it to 10.7 MHz it doesn't matter what your scan settings are.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Oh Wise Ones,
>
> I'm following the "test as you build" guide. All works fine for checking PLO2 and PLO1 (except my all mixers are missing about 2dB).
>
> To get any sensible results for PLO3 I have to change mode to "SA with TG" and change the centre frequency to 10.7MHz to get any signal into the crystal filter. This matches my understanding of how things should work, as the TG output is the difference between PLO2 and PLO3.
>
> Is this a documentation shortfall, or am I overlooking something obvious?
>
> I'm using Ver 115, Rev G.
>
> Thanks!
>
> davidh
>

7695. Re: PLO3 tests in "test as you build"

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-19 18:31:07 UTC
From: davidhooau
Topic: 7690 Message: 7695

Thanks Sam,

I still don't get it. In SG mode, PLO2 is fixed at 1024MHz, PLO3 will now be fixed at 1034.7MHz, so the mixer output will be a constant 10.7MHz. This is now in the passband of the filter, but the display will be a horizontal line for all scan settings.

In order to "see" the crystal filter response, as per the previous steps, surely we need TG or VNA mode?

davidh

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I think you are right. The procedure states that PLO3 will automatically be commanded to 1034 MHz, which is where it would be with the default signal generator frequency of 10 MHz. But that frequency won't get through the filter. You don't have to change modes, you just have to set the SG frequency to 10.7 MHz. The SG is exactly the same as the TG, except SG is available in Spectrum Analyzer mode and stays at a fixed frequency, so once you set it to 10.7 MHz it doesn't matter what your scan settings are.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
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> > Oh Wise Ones,
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> > I'm following the "test as you build" guide. All works fine for checking PLO2 and PLO1 (except my all mixers are missing about 2dB).
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> >
> > Is this a documentation shortfall, or am I overlooking something obvious?
> >
> > I'm using Ver 115, Rev G.
> >
> > Thanks!
> >
> > davidh
> >
>

7696. Re: [spectrumanalyzer] Re: ADC Testing Oddness

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-19 21:56:53 UTC
From: william sprowls
Topic: 7687 Message: 7696

Hi Greg,
For many applications, your warning is quite valid. However, a low Z source to drive an A to D is only necessary when high conversion rates are taken. For the MSA, the conversion rate is less than 1000 samples per second (very low rate). The input capacitor (.001 uf) on each A to D satisfies as a low Z impedance.
This current draw by the AtoD only occurs for about 100 nsec.
Scotty

--- On Sat, 2/19/11, Greg Broburg <semiflex@...> wrote:

From: Greg Broburg <semiflex@...>
Subject: [spectrumanalyzer] Re: ADC Testing Oddness
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, February 19, 2011, 10:05 AM

Warning about some AD converters is that they may

draw significant input current during the conversion

process. This is the current that is used in the

charge balancing sequence and in general is solved

with low Z drive to the AD input.

Greg

On 2/19/2011 9:52 AM, Sam wrote:

I assume the fact that you get a positive voltage reading
that drops off, means the capacitor charges due to some
board leakage (or IC leakage) and then discharges slowly
through your voltmeter. If the capacitor itself has very
low leakage, even a miniscule amount of leakage could
charge it when there is no input attached. This might be
another reason to attach a 10k resistor from input to
ground before testing the voltage. This would more closely
match how the input would function in the completed MSA.

Sam W.

--- In spectrumanalyzer@yahoogroups.com,
"Dale" <kb9jja@...> wrote:

>

> Sam,

>

> I went back and tested a bit more yesterday. I now have the phase ADC just about matching the Mag ADC. The difference I am seeing I think is due to the cap that goes from the input of the ADC to ground. They did not measure the same in circuit with my AADE cap meter. I also cleaned the board again real well and that seemed to help also. Even though my ohm meter showed close to the same reading when testing, I am guessing there was some gunk hidden under something that was causing the volt meter test that feeds a voltage to the ADC to be off. Once I cleaned everything the oddness with the switch in the center position went away also. If I short the Phase and Mag inputs together the numbers are almost identical, and they fall off at a very close rate now.

>

> Dale

7697. Re: [spectrumanalyzer] Re: PLO3 tests in "test as you build"

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-19 22:27:40 UTC
From: william sprowls
Topic: 7690 Message: 7697

Hi David,
 My "oops". The documentation is not correct. But you have already found the correct words I need to update the web page with.
"...change mode to "SA with TG" and change the center frequency to 10.7MHz."
  By the way, when testing PLO3, the mixing scheme changes to "low side mixing". The response of your Final Filter will reverse from what it looked like during PLO1 and PLO2 testing. If your filter is truly symmetrical (doubtful), you won't see a difference.
Scotty

--- On Sat, 2/19/11, davidhooau <dhooke@...> wrote:

From: davidhooau <dhooke@...>
Subject: [spectrumanalyzer] Re: PLO3 tests in "test as you build"
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, February 19, 2011, 12:31 PM

Thanks Sam,

I still don't get it. In SG mode, PLO2 is fixed at 1024MHz, PLO3 will now be fixed at 1034.7MHz, so the mixer output will be a constant 10.7MHz. This is now in the passband of the filter, but the display will be a horizontal line for all scan settings.

In order to "see" the crystal filter response, as per the previous steps, surely we need TG or VNA mode?

davidh

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:

>

> I think you are right. The procedure states that PLO3 will automatically be commanded to 1034 MHz, which is where it would be with the default signal generator frequency of 10 MHz. But that frequency won't get through the filter. You don't have to change modes, you just have to set the SG frequency to 10.7 MHz. The SG is exactly the same as the TG, except SG is available in Spectrum Analyzer mode and stays at a fixed frequency, so once you set it to 10.7 MHz it doesn't matter what your scan settings are.

> Sam W.

>

> --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:

> >

> > Oh Wise Ones,

> >

> > I'm following the "test as you build" guide. All works fine for checking PLO2 and PLO1 (except my all mixers are missing about 2dB).

> >

> > To get any sensible results for PLO3 I have to change mode to "SA with TG" and change the centre frequency to 10.7MHz to get any signal into the crystal filter. This matches my understanding of how things should work, as the TG output is the difference between PLO2 and PLO3.

> >

> > Is this a documentation shortfall, or am I overlooking something obvious?

> >

> > I'm using Ver 115, Rev G.

> >

> > Thanks!

> >

> > davidh

> >

>

7698. Re: PLO3 tests in "test as you build"

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-19 22:42:22 UTC
From: Sam
Topic: 7690 Message: 7698

Correct. I was thinking in terms of verifying the output of the PLO at a specified frequency, not actually scanning with it. To scan, you need to use the TG and center the scan around 10.7 MHz.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Thanks Sam,
>
> I still don't get it. In SG mode, PLO2 is fixed at 1024MHz, PLO3 will now be fixed at 1034.7MHz, so the mixer output will be a constant 10.7MHz. This is now in the passband of the filter, but the display will be a horizontal line for all scan settings.
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> In order to "see" the crystal filter response, as per the previous steps, surely we need TG or VNA mode?
>
> davidh
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>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> > >
> > > Oh Wise Ones,
> > >
> > > I'm following the "test as you build" guide. All works fine for checking PLO2 and PLO1 (except my all mixers are missing about 2dB).
> > >
> > > To get any sensible results for PLO3 I have to change mode to "SA with TG" and change the centre frequency to 10.7MHz to get any signal into the crystal filter. This matches my understanding of how things should work, as the TG output is the difference between PLO2 and PLO3.
> > >
> > > Is this a documentation shortfall, or am I overlooking something obvious?
> > >
> > > I'm using Ver 115, Rev G.
> > >

> > > Thanks!
> > >
> > > davidh
> > >
> >
>

7699. PLO1 and 3 frequency limited by 20V rail

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-20 09:15:04 UTC
From: davidhooau
Topic: 7699 Message: 7699

Folks,

Many thanks for all of the help and patience shown so far. I'm really enjoying building this gadget, and apologise for all of the list noise I'm creating.

Both of my PLLs were falling off a cliff at about the 1.85GHz mark, as the VCOs needed a higher voltage than the 18.6V available from the LT1677 with the 18.8V available from the CB. I've jumpered the voltage doubler to the input 12V rail, which just gets me to 2.1GHz. I don't really like this solution, as I'm relying on the LT1677 to function as a voltage regulator, so will find an alternative solution (maybe Sam's 23V regulator).

Is this a common problem? Should it get a mention in the SLIM or build doco somewhere?

Cheerio,

davidh

7700. Re: PLO1 and 3 frequency limited by 20V rail

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-20 14:23:39 UTC
From: Sam
Topic: 7699 Message: 7700

This isn't list noise; this is what this site is all about.

I haven't heard of this weak VCO problem before. Your frequency at 18.6V is well short of that in the "typical" chart in the specs. It sounds like even if you tweak the doubler voltage into the 19-20V range somehow, it would still not be enough. And I agree that directly using the 12V supply for the doubler does not seem like a good idea, though at least by that method you verified that the VCO can get to the necessary frequency. It sounds like you may need the +23V supply. Or, maybe you could use an 11V LDO regulator (if there is such a thing--maybe an adjustable regulator) to get regulated 11V to feed the doubler. (Actually, I don't know the doubler's max input voltage.)

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Folks,
>
> Many thanks for all of the help and patience shown so far. I'm really enjoying building this gadget, and apologise for all of the list noise I'm creating.
>
> Both of my PLLs were falling off a cliff at about the 1.85GHz mark, as the VCOs needed a higher voltage than the 18.6V available from the LT1677 with the 18.8V available from the CB. I've jumpered the voltage doubler to the input 12V rail, which just gets me to 2.1GHz. I don't really like this solution, as I'm relying on the LT1677 to function as a voltage regulator, so will find an alternative solution (maybe Sam's 23V regulator).
>
> Is this a common problem? Should it get a mention in the SLIM or build doco somewhere?
>
> Cheerio,
>
> davidh
>

7701. Re: [spectrumanalyzer] PLO1 and 3 frequency limited by 20V rail

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-20 14:28:45 UTC
From: william sprowls
Topic: 7699 Message: 7701

Hi David,
 You should be getting 19.0 volts on the input to the PLO 1 (3) module. The LT1677 should see 18.94 volts. Make sure your 10 ohm voltage drop resistors are really 10 ohm. You have too much voltage drop.
 Do not use more than 10 volts for operating the LMC7660 doublers. I think 11 volts is absolute max for those chips.
Are you using other than the Minicircuits VCO's? Did you deviate from the specified components anywhere in the +20v circuits?
Scotty

--- On Sun, 2/20/11, davidhooau <dhooke@...> wrote:

From: davidhooau <dhooke@...>
Subject: [spectrumanalyzer] PLO1 and 3 frequency limited by 20V rail
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, February 20, 2011, 3:15 AM

Folks,

Many thanks for all of the help and patience shown so far. I'm really enjoying building this gadget, and apologise for all of the list noise I'm creating.

Both of my PLLs were falling off a cliff at about the 1.85GHz mark, as the VCOs needed a higher voltage than the 18.6V available from the LT1677 with the 18.8V available from the CB. I've jumpered the voltage doubler to the input 12V rail, which just gets me to 2.1GHz. I don't really like this solution, as I'm relying on the LT1677 to function as a voltage regulator, so will find an alternative solution (maybe Sam's 23V regulator).

Is this a common problem? Should it get a mention in the SLIM or build doco somewhere?

Cheerio,

davidh

7702. Re: PLO1 and 3 frequency limited by 20V rail

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-20 21:56:59 UTC
From: davidhooau
Topic: 7699 Message: 7702

Hi Scotty,

When the PLL is locked, the voltages are exactly as you say. When unlocked, one of the LT1677 input diodes is biased on, causing the additional current draw and hence the voltages I reported.

I think the VCOs are the likely culprits, as the control voltage @ 1013MHz is 3.27V (2.55V according to the guide).

I'm going to reconfigure in SG mode to check that the PLOs are generating likely correct frequencies, in case I have an issue with signal integrity with the digital control lines and am commanding the PLLs to stupid frequencies. I'll also try to borrow (or build) a decent counter, as my ancient fluke only goes to 125MHz.

Cheers,

davidh

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi David,
> Â You should be getting 19.0 volts on the input to the PLO 1 (3) module. The LT1677 should see 18.94 volts. Make sure your 10 ohm voltage drop resistors are really 10 ohm. You have too much voltage drop.
> Â Do not use more than 10 volts for operating the LMC7660 doublers. I think 11 volts is absolute max for those chips.
> Are you using other than the Minicircuits VCO's? Did you deviate from the specified components anywhere in the +20v circuits?
> Scotty
>
> --- On Sun, 2/20/11, davidhooau <dhooke@...> wrote:
>
> From: davidhooau <dhooke@...>
> Subject: [spectrumanalyzer] PLO1 and 3 frequency limited by 20V rail
> To: spectrumanalyzer@yahoogroups.com
> Date: Sunday, February 20, 2011, 3:15 AM
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> Is this a common problem? Should it get a mention in the SLIM or build doco somewhere?
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> Cheerio,
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> davidh
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7703. Re: [spectrumanalyzer] Re: PLO1 and 3 frequency limited by 20V rail

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-20 22:17:46 UTC
From: william sprowls
Topic: 7699 Message: 7703

Hi David and All,
 It is likely that your PLL's are locking to the correct frequency. You can be more certain when you have the basic SA chain completed.
 Of the Minicircuits VCO's I tested early in this project, all exceded the MSA frequency range requirements with the specified voltages created by the 20 volt doubler. PLO 1 would lock at 2013.3 MHz with about 17 volts on the Op Amp. It is quite possible that more recent batches of VCO's from MiniC are not as good.
 As Sam suggested, supplying 11.0 volts to the voltage doubler should solve your problem.
Scotty

--- On Sun, 2/20/11, davidhooau <dhooke@...> wrote:

From: davidhooau <dhooke@gmail.com>
Subject: [spectrumanalyzer] Re: PLO1 and 3 frequency limited by 20V rail
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, February 20, 2011, 3:56 PM

Hi Scotty,

When the PLL is locked, the voltages are exactly as you say. When unlocked, one of the LT1677 input diodes is biased on, causing the additional current draw and hence the voltages I reported.

I think the VCOs are the likely culprits, as the control voltage @ 1013MHz is 3.27V (2.55V according to the guide).

I'm going to reconfigure in SG mode to check that the PLOs are generating likely correct frequencies, in case I have an issue with signal integrity with the digital control lines and am commanding the PLLs to stupid frequencies. I'll also try to borrow (or build) a decent counter, as my ancient fluke only goes to 125MHz.

Cheers,

davidh

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> From: davidhooau <dhooke@...>

> Subject: [spectrumanalyzer] PLO1 and 3 frequency limited by 20V rail

> To: spectrumanalyzer@yahoogroups.com

> Date: Sunday, February 20, 2011, 3:15 AM

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> Folks,

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> Both of my PLLs were falling off a cliff at about the 1.85GHz mark, as the VCOs needed a higher voltage than the 18.6V available from the LT1677 with the 18.8V available from the CB. I've jumpered the voltage doubler to the input 12V rail, which just gets me to 2.1GHz. I don't really like this solution, as I'm relying on the LT1677 to function as a voltage regulator, so will find an alternative solution (maybe Sam's 23V regulator).

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>

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> Is this a common problem? Should it get a mention in the SLIM or build doco somewhere?

>

>

>

> Cheerio,

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>

> davidh

>

7704. Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-21 14:33:59 UTC
From: pzerkel
Topic: 7492 Message: 7704

I removed U3 completely, and replaced U2 and Q1 with new parts. Now when the ADC is powered up I get a trace at the TOP of the graph which does not move until power is removed (even as input voltage to J1 is varied). When the ADC has powered up, the input data is all 65535's. When power is removed the input data is all 0's.

I have checked voltage at U2-pin 3 and it follows the voltage input at J1.

I have two different control boards and the behavior is the same with this ADC attached to both control boards. Each of those CB's pass the test-as-you-build tests.

I do have an extra blank ADC-10 PWB and one extra AD7685 & MMUN2211, plus enough spare parts to build at least the MAG side of an additional ADC board. I will probably do that, and see if I can get a working ADC yet.

But still I would like to be able to troubleshoot this. It does seem to me that if the software is seeing 65536, then the ADC must be pumping out some kind of data?

-Paul

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> It is possible to have a latch output that is slow, or doesn't produce full voltage, but those are hard to test for. You should check that the ADC output is toggling while a scan is active; if it is, it is probably getting the necessary commands. (Maybe you need to have some input voltage, so it is not outputting all zeroes.)
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> You should also use the CB tester to see whether the MSA can read the ADC outputs; you probably need to disconnect the ADC and connect those parallel port lines to 0 or +5 (you should have pull-up resistors on those lines on the control board, so if you connect nothing the voltage will be +5). Scotty's CB tester and the one in the beta software can test read the "control" lines that the ADC connects to; I don't recall if my tester does that.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "pzerkel" <pzerkel@> wrote:
> >
> >
> >
> > Re: ADC trouble shooting
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> > Sam,
> >
> > Is it safe to assume that if the control board is still passing all the tests, then the latch pins are okay? I made up a little board with 8 LEDs and resistors and a nine-pin connector to test the CB with. It still seems to work as expected when running the CB test

program.
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> > -Paul Zerkel
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> >
> > >communication from the latch, since neither IC now works. You might check the
> > toggling action on the latch pins.
> > >
> >
>

7705. Re: [spectrumanalyzer] Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-21 14:53:24 UTC
From: Jurgen
Topic: 7492 Message: 7705

I had exactly the same. Look at the serial out you might see only a single bit toggling, at least that is the way it worked for me. I needed to replace the chip and it now works fine. I must have damaged it by having reversed the DB25 connector.
Check for solder bridges.

Jurgen

On 2/21/2011 9:33 AM, pzerkel wrote:
>
>
> I removed U3 completely, and replaced U2 and Q1 with new parts. Now
> when the ADC is powered up I get a trace at the TOP of the graph which
> does not move until power is removed (even as input voltage to J1 is
> varied). When the ADC has powered up, the input data is all 65535's.
> When power is removed the input data is all 0's.
>
> I have checked voltage at U2-pin 3 and it follows the voltage input at J1.
>
> I have two different control boards and the behavior is the same with
> this ADC attached to both control boards. Each of those CB's pass the
> test-as-you-build tests.
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> I do have an extra blank ADC-10 PWB and one extra AD7685 & MMUN2211,
> plus enough spare parts to build at least the MAG side of an
> additional ADC board. I will probably do that, and see if I can get a
> working ADC yet.
>
> But still I would like to be able to troubleshoot this. It does seem
> to me that if the software is seeing 65536, then the ADC must be
> pumping out some kind of data?
>
> -Paul
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@...> wrote:
> >
> > It is possible to have a latch output that is slow, or doesn't
> produce full voltage, but those are hard to test for. You should check
> that the ADC output is toggling while a scan is active; if it is, it
> is probably getting the necessary commands. (Maybe you need to have
> some input voltage, so it is not outputting all zeroes.)
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> > You should also use the CB tester to see whether the MSA can read
> the ADC outputs; you probably need to disconnect the ADC and connect

> those parallel port lines to 0 or +5 (you should have pull-up
> resistors on those lines on the control board, so if you connect
> nothing the voltage will be +5). Scotty's CB tester and the one in the
> beta software can test read the "control" lines that the ADC connects
> to; I don't recall if my tester does that.
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "pzerkel" <pzerkel@> wrote:
> > >
> > >
> > >
> > > Re: ADC trouble shooting
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> > > Sam,
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> > > Is it safe to assume that if the control board is still passing
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> with 8 LEDs and resistors and a nine-pin connector to test the CB
> with. It still seems to work as expected when running the CB test program.
> > >
> > > -Paul Zerkel
> > >
> > >
> > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
> > > >
> > >
> > > >communication from the latch, since neither IC now works. You
> might check the
> > > toggling action on the latch pins.
> > > >
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> >
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>

7706. Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-21 16:50:37 UTC
From: Sam
Topic: 7492 Message: 7706

The software simply clocks the ADC to get it to spit out bits, and then reads. If the ADC is not working, the software will still read something. It reads the inverted value of SDO. So the fact that you read all ones doesn't mean the ADC is doing anything.

If the software is displaying the max ADC value (all ones), that means it is actually reading all zeroes from the hardware (due to the SDO inversion by Q1). That means the SDO pin is stuck high, or Q1's output is stuck low.

Either the ADC is not receiving the Convert or Clock signals, or it is not responding to them. Or, it is responding digitally but its conversion mechanism is messed up. Finally, maybe the SDO pin is responding but Q1's collector never goes high.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "pzerkel" <pzerkel@...> wrote:
>
>
> I removed U3 completely, and replaced U2 and Q1 with new parts. Now when the ADC is powered up I get a trace at the TOP of the graph which does not move until power is removed (even as input voltage to J1 is varied). When the ADC has powered up, the input data is all 65535's. When power is removed the input data is all 0's.
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> I have two different control boards and the behavior is the same with this ADC attached to both control boards. Each of those CB's pass the test-as-you-build tests.
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> I do have an extra blank ADC-10 PWB and one extra AD7685 & MMUN2211, plus enough spare parts to build at least the MAG side of an additional ADC board. I will probably do that, and see if I can get a working ADC yet.
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> But still I would like to be able to troubleshoot this. It does seem to me that if the software is seeing 65536, then the ADC must be pumping out some kind of data?
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> -Paul
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> > You should also use the CB tester to see whether the MSA can read the ADC outputs; you probably need to disconnect the ADC and connect those parallel port lines to 0 or +5 (you

should have pull-up resistors on those lines on the control board, so if you connect nothing the voltage will be +5). Scotty's CB tester and the one in the beta software can test read the "control" lines that the ADC connects to; I don't recall if my tester does that.
> >
> > Sam W.
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> > --- In spectrumanalyzer@yahoogroups.com, "pzerkel" <pzerkel@> wrote:
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> > > Is it safe to assume that if the control board is still passing all the tests, then the latch pins are okay? I made up a little board with 8 LEDs and resistors and a nine-pin connector to test the CB with. It still seems to work as expected when running the CB test program.
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> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > > >communication from the latch, since neither IC now works. You might check the
> > > toggling action on the latch pins.
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> > >
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>

7707. Re: [spectrumanalyzer] Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-21 20:02:06 UTC
From: william sprowls
Topic: 7492 Message: 7707

Hi All,
 When testing the AtoD using the instructions on the web pages, there has been some confusion. With no input to the AtoD's the AtoD chips "see" only the video filter capacitors. During Wide or Mid selection, the input circuit impedance is extremely high. Basically, an open circuit input. The input voltage can "float" somewhere between 0v and 5v. This will give strange and irratic traces in both Mag and Phase. But, that is not a bad thing. If you see Magdata or Phadata moving around between 0 bits and 65535 bits, this is good. It means your pcb is nice and clean. You can read these bits by doing this:
a. Run the MSA software with the MSA hardware attached.
b. Halt and under menu item Options, select Show Variables.
c. "Continue" the sweep and read the Magdata and Phadata in the Variables Window.

 If you use a voltmeter probe from an AtoD input to ground, the input resistance of the voltmeter should pull the "floating" voltage to ground (or within a few millivolts to ground). The Magdata or Phadata should read 0 or maybe a few bits more.
 If you use the voltmeter probes from an AtoD input to +5v, the input resistance of the voltmeter should pull the "floating" voltage to +5v (or within a few millivolts below +5v). The Magdata or Phadata should read 65535 or maybe a few bits less.
  Now let me say this. Those readings will guarantee MSA accuracy. However, if those readings are off, do this:
Connect (or carefully touch) a 10K resistor from an AtoD input to ground. It must pull the "floating" voltage to ground. The Magdata or Phadata should read 0 bits. Connect (or carefully touch) a 10K resistor from an AtoD input to +5v. It must pull the "floating" voltage to +5v. The Magdata or Phadata should read 65535 bits.
 Your pcb may not be perfectly clean, but if these resistor tests are successful, your MSA will be accurate.

Here are a few more notes on the AtoD testing process.
1. The computer uses LPT, pin 11 to read the Magnitude AtoD.
2. The computer uses LPT, pin 10 to read the Phase AtoD.
3. Most computers have an internal resistor pull-up to its internal 5 volt bus. Usually the value is between 1000 and 3000 ohms. If your computer does not have pull-ups, they must be installed on the Control Board as R11 and R12. Here is a quick test to check your computer's LPT lines:
a. Run the MSA software without the MSA hardware attached.
b. Halt and under menu item Options, select Show Variables.
c. "Continue" the sweep and read the Magdata and Phadata in the Variables Window. They shoud both read 0.
d. On the computer's lpt port, short out pin 11 to ground (either the shield or pin 23 or pin 24). The Magdata should change to maximum count, 65535.
e. On the computer's lpt port, short out pin 10 to ground (either the shield or pin 22 or pin 23). The Phadata should change to maximum count, 65535.
f. If either fail to change, the computer does not have internal pull-up resistors.
g. For the computer to read a low level data signal (0 volts), the data source must "pull down" the computer. This requires about 2 ma of current. This is more than the .5 ma

allowable by the AtoD chip. This why the MMUN 2211 is used as a buffer between the AtoD chip and the computer. However, it does invert the data from the AtoD chip. The software knows this and accounts for it.
h. There is one problem that could create an error in readings. There is a time delay in the MMUN2211 in which an extremely fast computer could fail to read proper data. This "bug" has been fixed with a software change, but it is still possible. I am looking into a hardware modification to overcome this MMUN bug.
Scotty

--- On Mon, 2/21/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@comcast.net>
Subject: [spectrumanalyzer] Re: ADC trouble shooting
To: spectrumanalyzer@yahoogroups.com
Date: Monday, February 21, 2011, 10:50 AM

The software simply clocks the ADC to get it to spit out bits, and then reads. If the ADC is not working, the software will still read something. It reads the inverted value of SDO. So the fact that you read all ones doesn't mean the ADC is doing anything.

If the software is displaying the max ADC value (all ones), that means it is actually reading all zeroes from the hardware (due to the SDO inversion by Q1). That means the SDO pin is stuck high, or Q1's output is stuck low.

Either the ADC is not receiving the Convert or Clock signals, or it is not responding to them. Or, it is responding digitally but its conversion mechanism is messed up. Finally, maybe the SDO pin is responding but Q1's collector never goes high.

Sam W.

--- In spectrumanalyzer@...m, "pzerkel" <pzerkel@...> wrote:

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> -Paul

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> > Sam W.

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> > --- In spectrumanalyzer@yahoogroups.com, "pzerkel" <pzerkel@> wrote:

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> > > Re: ADC trouble shooting

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> > > Is it safe to assume that if the control board is still passing all the tests, then the latch pins are okay? I made up a little board with 8 LEDs and resistors and a nine-pin connector to test the CB with. It still seems to work as expected when running the CB test

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>

7708. Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-22 22:37:57 UTC
From: Sam
Topic: 7492 Message: 7708

I suggest installing the pull-ups whether your computer has them or not, because you may not always be using that computer.

I also suggest going directly to the 10 kohm test for the input because it sounds like not using the resistor is causing many false negatives due to very high impedance leakage paths.

Finally, when you test the phase ADC by connecting it to 0V or 5V through the resistor, the display will jump between 0 and +/-180 degrees because the software is trying to invert the PDM, which is not there. So you'll get the same jumpy display whether using 0 or +5V. 10k resistors to both 0 and +5V will give an intermediate value which should give a stable display at +/-180 degrees. (Conceivably, it could jump between +180 and -180 degrees, which is meaningless jump but messy on the screen. And strictly speaking with double resistors you should use 20k resistors to check for leakage to match the in-circuit impedance feeding the phase ADC.)

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi All,
> Â When testing the AtoD using the instructions on the web pages, there has been some confusion. With no input to the AtoD's the AtoD chips "see" only the video filter capacitors. During Wide or Mid selection, the input circuit impedance is extremely high. Basically, an open circuit input. The input voltage can "float" somewhere between 0v and 5v. This will give strange and irratic traces in both Mag and Phase. But, that is not a bad thing. If you see Magdata or Phadata moving around between 0 bits and 65535 bits, this is good. It means your pcb is nice and clean. You can read these bits by doing this:
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> b. Halt and under menu item Options, select Show Variables.
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> Â If you use a voltmeter probe from an AtoD input to ground, the input resistance of the voltmeter should pull the "floating" voltage to ground (or within a few millivolts to ground). The Magdata or Phadata should read 0 or maybe a few bits more.
> Â If you use the voltmeter probes from an AtoD input to +5v, the input resistance of the voltmeter should pull the "floating" voltage to +5v (or within a few millivolts below +5v). The Magdata or Phadata should read 65535 or maybe a few bits less.
> Â Now let me say this. Those readings will guarantee MSA accuracy. However, if those readings are off, do this:
> Connect (or carefully touch) a 10K resistor from an AtoD input to ground. It must pull the "floating" voltage to ground. The Magdata or Phadata should read 0 bits. Connect (or carefully touch) a 10K resistor from an AtoD input to +5v. It must pull the "floating" voltage to +5v. The Magdata or Phadata should read 65535 bits.
> Â Your pcb may not be perfectly clean, but if these resistor tests are successful, your MSA will be accurate.

>
> Here are a few more notes on the AtoD testing process.
> 1. The computer uses LPT, pin 11 to read the Magnitude AtoD.
> 2. The computer uses LPT, pin 10 to read the Phase AtoD.
> 3. Most computers have an internal resistor pull-up to its internal 5 volt bus. Usually the value is between 1000 and 3000 ohms. If your computer does not have pull-ups, they must be installed on the Control Board as R11 and R12. Here is a quick test to check your computer's LPT lines:
> a. Run the MSA software without the MSA hardware attached.
> b. Halt and under menu item Options, select Show Variables.
> c. "Continue" the sweep and read the Magdata and Phadata in the Variables Window. They shoud both read 0.
> d. On the computer's lpt port, short out pin 11 to ground (either the shield or pin 23 or pin 24). The Magdata should change to maximum count, 65535.
> e.Â On the computer's lpt port, short out pin 10 to ground (either the shield or pin 22 or pin 23). The Phadata should change to maximum count, 65535.
> f. If either fail to change, the computer does not have internal pull-up resistors.
> g. For the computer to read a low level data signal (0 volts), the data source must "pull down" the computer. This requires about 2 ma of current. This is more than the .5 ma allowable by the AtoD chip. This why the MMUN 2211 is used as a buffer between the AtoD chip and the computer. However, it does invert the data from the AtoD chip. The software knows this and accounts for it.
> h. There is one problem that could create an error in readings. There is a time delay in the MMUN2211 in which an extremely fast computer could fail to read proper data. This "bug" has been fixed with a software change, but it is still possible. I am looking into a hardware modification to overcome this MMUN bug.
> Scotty
>
> --- On Mon, 2/21/11, Sam <swetterlin@...> wrote:
>
> From: Sam <swetterlin@...>
> Subject: [spectrumanalyzer] Re: ADC trouble shooting
> To: spectrumanalyzer@yahoogroups.com
> Date: Monday, February 21, 2011, 10:50 AM
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> The software simply clocks the ADC to get it to spit out bits, and then reads. If the ADC is not working, the software will still read something. It reads the inverted value of SDO. So the fact that you read all ones doesn't mean the ADC is doing anything.
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> If the software is displaying the max ADC value (all ones), that means it is actually reading all zeroes from the hardware (due to the SDO inversion by Q1). That means the SDO pin is stuck high, or Q1's output is stuck low.
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> Either the ADC is not receiving the Convert or Clock signals, or it is not responding to them. Or, it is responding digitally but its conversion mechanism is messed up. Finally, maybe the SDO pin is responding but Q1's collector never goes high.
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> Sam W.
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> --- In spectrumanalyzer@yahoogroups.com, "pzerkel" <pzerkel@> wrote:
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> > I removed U3 completely, and replaced U2 and Q1 with new parts. Now when the ADC is powered up I get a trace at the TOP of the graph which does not move until power is removed (even as input voltage to J1 is varied). When the ADC has powered up, the input data is all 65535's. When power is removed the input data is all 0's.
>
> >
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> > I have checked voltage at U2-pin 3 and it follows the voltage input at J1.
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> > I have two different control boards and the behavior is the same with this ADC attached to both control boards. Each of those CB's pass the test-as-you-build tests.
>
> >
>
> > I do have an extra blank ADC-10 PWB and one extra AD7685 & MMUN2211, plus enough spare parts to build at least the MAG side of an additional ADC board. I will probably do that, and see if I can get a working ADC yet.
>
> >

>
> > But still I would like to be able to troubleshoot this. It does seem to me that if the software is seeing 65536, then the ADC must be pumping out some kind of data?
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>
> > -Paul
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> > > It is possible to have a latch output that is slow, or doesn't produce full voltage, but those are hard to test for. You should check that the ADC output is toggling while a scan is active; if it is, it is probably getting the necessary commands. (Maybe you need to have some input voltage, so it is not outputting all zeroes.)
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> > > You should also use the CB tester to see whether the MSA can read the ADC outputs; you probably need to disconnect the ADC and connect those parallel port lines to 0 or +5 (you should have pull-up resistors on those lines on the control board, so if you connect nothing the voltage will be +5). Scotty's CB tester and the one in the beta software can test read the "control" lines that the ADC connects to; I don't recall if my tester does that.
>
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> > > Sam W.
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> > > > Re: ADC trouble shooting
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> > > > Sam,
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> > > > Is it safe to assume that if the control board is still passing all the tests, then the latch pins are okay? I made up a little board with 8 LEDs and resistors and a nine-pin connector to test the CB with. It still seems to work as expected when running the CB test program.
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> > > > -Paul Zerkel
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> > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > > > toggling action on the latch pins.
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7709. PDM and Range Tests

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-22 22:51:47 UTC
From: davidhooau
Topic: 7709 Message: 7709

Folks,

I'm working on the PDM and Range tests, and have 2 queries please.

> In step 8, I'm seeing about 11dB "droop" from 0Hz to 1GHz, at both mixer outputs. I've posted an image in "davidh's build" in the photo section showing the mixer 4 output. All of the mixers do the same thing, using all PLO outputs in any combination. Is this normal?

> At step 11, when setting the span to 200MHz, I get a message "MESSAGE: PLL1, 2326 Bcounter<Acounter", and hence cannot check the PLO lower limits.

Thanks,

davidh

7710. Re: [spectrumanalyzer] Re: ADC trouble shooting

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-22 23:18:16 UTC
From: william sprowls
Topic: 7492 Message: 7710

Sam makes a good point. If testing in the SA Mode, with the Vairables Window open, you will not get a Phase trace at all. You will, however, get the correct Phadata bit count.
 When in the VNA Mode and getting a Phase trace, you can open the Special Tests Window and select the PDM to go into the "Normal" configuration. This way, the trace will not toggle between the 0/180. Even better, change the left Phase scale to +360 degrees for the top and 0 degrees for the bottom. The trace will then not toggle between +180 and -180 degrees.
Scotty

--- On Tue, 2/22/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: ADC trouble shooting
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, February 22, 2011, 4:37 PM

I suggest installing the pull-ups whether your computer has them or not, because you may not always be using that computer.

I also suggest going directly to the 10 kohm test for the input because it sounds like not using the resistor is causing many false negatives due to very high impedance leakage paths.

Finally, when you test the phase ADC by connecting it to 0V or 5V through the resistor, the display will jump between 0 and +/-180 degrees because the software is trying to invert the PDM, which is not there. So you'll get the same jumpy display whether using 0 or +5V. 10k resistors to both 0 and +5V will give an intermediate value which should give a stable display at +/-180 degrees. (Conceivably, it could jump between +180 and -180 degrees, which is meaningless jump but messy on the screen. And strictly speaking with double resistors you should use 20k resistors to check for leakage to match the in-circuit impedance feeding the phase ADC.)

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:

>

> Hi All,

> Â When testing the AtoD using the instructions on the web pages, there has been some confusion. With no input to the AtoD's the AtoD chips "see" only the video filter capacitors. During Wide or Mid selection, the input circuit impedance is extremely high. Basically, an open circuit input. The input voltage can "float" somewhere between 0v and 5v. This will give strange and irratic traces in both Mag and Phase. But, that is not a bad thing. If you see Magdata or Phadata moving around between 0 bits and 65535 bits, this is good. It means your pcb is nice and clean. You can read these bits by doing this:

> a. Run the MSA software with the MSA hardware attached.

> b. Halt and under menu item Options, select Show Variables.

> c. "Continue" the sweep and read the Magdata and Phadata in the Variables Window.

>

> Â If you use a voltmeter probe from an AtoD input to ground, the input resistance of the voltmeter should pull the "floating" voltage to ground (or within a few millivolts to ground). The Magdata or Phadata should read 0 or maybe a few bits more.

> Â If you use the voltmeter probes from an AtoD input to +5v, the input resistance of the voltmeter should pull the "floating" voltage to +5v (or within a few millivolts below +5v). The Magdata or Phadata should read 65535 or maybe a few bits less.

> Â Now let me say this. Those readings will guarantee MSA accuracy. However, if those readings are off, do this:

> Connect (or carefully touch) a 10K resistor from an AtoD input to ground. It must pull the "floating" voltage to ground. The Magdata or Phadata should read 0 bits. Connect (or carefully touch) a 10K resistor from an AtoD input to +5v. It must pull the "floating" voltage to +5v. The Magdata or Phadata should read 65535 bits.

> Â Your pcb may not be perfectly clean, but if these resistor tests are successful, your MSA will be accurate.

>

> Here are a few more notes on the AtoD testing process.

> 1. The computer uses LPT, pin 11 to read the Magnitude AtoD.

> 2. The computer uses LPT, pin 10 to read the Phase AtoD.

> 3. Most computers have an internal resistor pull-up to its internal 5 volt bus. Usually the value is between 1000 and 3000 ohms. If your computer does not have pull-ups, they must be installed on the Control Board as R11 and R12. Here is a quick test to check your computer's LPT lines:

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> c. "Continue" the sweep and read the Magdata and Phadata in the Variables Window. They shoud both read 0.

> d. On the computer's lpt port, short out pin 11 to ground (either the shield or pin 23 or pin 24). The Magdata should change to maximum count, 65535.

> e.Â On the computer's lpt port, short out pin 10 to ground (either the shield or pin 22 or pin 23). The Phadata should change to maximum count, 65535.

> f. If either fail to change, the computer does not have internal pull-up resistors.

> g. For the computer to read a low level data signal (0 volts), the data source must "pull down" the computer. This requires about 2 ma of current. This is more than the .5 ma allowable by the AtoD chip. This why the MMUN 2211 is used as a buffer between the AtoD

chip and the computer. However, it does invert the data from the AtoD chip. The software knows this and accounts for it.

> h. There is one problem that could create an error in readings. There is a time delay in the MMUN2211 in which an extremely fast computer could fail to read proper data. This "bug" has been fixed with a software change, but it is still possible. I am looking into a hardware modification to overcome this MMUN bug.

> Scotty

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> --- On Mon, 2/21/11, Sam <swetterlin@...> wrote:

>

> From: Sam <swetterlin@...>

> Subject: [spectrumanalyzer] Re: ADC trouble shooting

> To: spectrumanalyzer@yahoogroups.com

> Date: Monday, February 21, 2011, 10:50 AM

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> If the software is displaying the max ADC value (all ones), that means it is actually reading all zeroes from the hardware (due to the SDO inversion by Q1). That means the SDO pin is stuck high, or Q1's output is stuck low.

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> Either the ADC is not receiving the Convert or Clock signals, or it is not responding to them. Or, it is responding digitally but its conversion mechanism is messed up. Finally, maybe the SDO pin is responding but Q1's collector never goes high.

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> > I have two different control boards and the behavior is the same with this ADC attached to both control boards. Each of those CB's pass the test-as-you-build tests.

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> > I do have an extra blank ADC-10 PWB and one extra AD7685 & MMUN2211, plus enough spare parts to build at least the MAG side of an additional ADC board. I will probably do that, and see if I can get a working ADC yet.

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> > But still I would like to be able to troubleshoot this. It does seem to me that if the software is seeing 65536, then the ADC must be pumping out some kind of data?

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> > -Paul

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> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:

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> > > It is possible to have a latch output that is slow, or doesn't produce full voltage, but those are hard to test for. You should check that the ADC output is toggling while a scan is active; if it is, it is probably getting the necessary commands. (Maybe you need to have some input voltage, so it is not outputting all zeroes.)

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> > > Sam W.

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> > > --- In spectrumanalyzer@yahoogroups.com, "pzerkel" <pzerkel@> wrote:

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> > > > Re: ADC trouble shooting

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> > > > -Paul Zerkel

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> > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:

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> > > > >communication from the latch, since neither IC now works. You might check the

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> > > > toggling action on the latch pins.

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7711. Re: PDM and Range Tests

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-22 23:54:43 UTC
From: Sam
Topic: 7709 Message: 7711

David,
Your graph runs to 1092 MHz with 11 dB droop. It looks like it would be about 9 dB to 1 GHz. Mine droops 8 dB. I thought of replacing the mixer until I found out another builder also had 8 dB droop. Yours appears to be in the same ballpark.

This is not a major problem, but it does create one issue. The PDM will function fine with this signal, except that the duty cycle of the input squarer will change very slightly over frequency. This means that the effect of inverting the PDM reference differs slightly over frequency. When you calibrate your PDM inversion, you may find that the phase shift caused by the inversion is, say, 190 degrees at 50 MHz and 190.5 degrees at 1 GHz. This means that if I specify the inversion as 190 degrees, an error of 0.5 dB can be created at 1 GHz when the PDM is inverted.

My PDM inversion is fairly constant to 200 MHz, and then starts to change slowly, with a max change of 0.5 deg.

I have not found this to be a significant problem, but I would like to eliminate the issue someday. One possibility would be a weak filter that would attenuate the lower frequencies perhaps 6 dB and not have much effect on the highest frequency. Maybe a simple filter placed together in series with the Mixer 4 RF input, would do the trick. Another approach would be to amplify the Mixer 4 output, because at higher signal levels the droop does not have much effect on the PDM. Finaly, the problem could be solved by having the software use a PDM inversion table at several frequencies, rather than a fixed value for all frequencies.

Some increased phase error at higher frequencies is acceptable because there are so many other error sources at those frequencies--such as the tightness of SMA connectors or minor defects in calibration standards. So I wouldn't sweat this issue until you have the MSA completed.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Folks,
>
> I'm working on the PDM and Range tests, and have 2 queries please.
>
> > In step 8, I'm seeing about 11dB "droop" from 0Hz to 1GHz, at both mixer outputs. I've posted an image in "davidh's build" in the photo section showing the mixer 4 output. All of the mixers do the same thing, using all PLO outputs in any combination. Is this normal?
>
> > At step 11, when setting the span to 200MHz, I get a message "MESSAGE: PLL1, 2326 Bcounter<Acounter", and hence cannot check the PLO lower limits.
>
> Thanks,

>
> davidh
>

7712. Re: [spectrumanalyzer] PDM and Range Tests

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-22 23:57:53 UTC
From: william sprowls
Topic: 7709 Message: 7712

Hi David,
 I need to do some work on the Integration and Verification Test Procedure web page.
Step 11 is bogus. My fault. When PLO1 or PLO3 gets a command to go below a legal counter code, the MSA will give an error. For this step change the span to 20 Mhz. You should see a normal response with no break-up. This test is just supposed to verify the PLO's will operate at their lowest ratings.

Step 8 is another story. You really do have quite a drop off. However, you are starting with low power (-21 dBm). It should be around -11 dBm. Do you trust your attenuator? Also did you do the coarse Mag calibration earlier on the page.

I will look at this a little closer tomorrow.
Scotty

--- On Tue, 2/22/11, davidhooau <dhooke@...> wrote:

From: davidhooau <dhooke@...>
Subject: [spectrumanalyzer] PDM and Range Tests
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, February 22, 2011, 4:51 PM

Folks,

I'm working on the PDM and Range tests, and have 2 queries please.

> In step 8, I'm seeing about 11dB "droop" from 0Hz to 1GHz, at both mixer outputs. I've posted an image in "davidh's build" in the photo section showing the mixer 4 output. All of the mixers do the same thing, using all PLO outputs in any combination. Is this normal?

> At step 11, when setting the span to 200MHz, I get a message "MESSAGE: PLL1, 2326 Bcounter<Acounter", and hence cannot check the PLO lower limits.

Thanks,

davidh

7713. Re: PDM and Range Tests

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-23 00:05:29 UTC
From: Sam
Topic: 7709 Message: 7713

I was focusing on the droop rather than the absolute level, so I didn't notice the low signal level that Scotty points out. You probably need to resolve that before worrying about the droop.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi David,
> Â I need to do some work on the Integration and Verification Test Procedure web page.
> Step 11 is bogus. My fault. When PLO1 or PLO3 gets a command to go below a legal counter code, the MSA will give an error. For this step change the span to 20 Mhz. You should see a normal response with no break-up. This test is just supposed to verify the PLO's will operate at their lowest ratings.
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> I will look at this a little closer tomorrow.
> Scotty
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> --- On Tue, 2/22/11, davidhooau <dhooke@...> wrote:
>
> From: davidhooau <dhooke@...>
> Subject: [spectrumanalyzer] PDM and Range Tests
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, February 22, 2011, 4:51 PM
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> Thanks,
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> davidh
>

7714. Re: PDM and Range Tests

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-23 01:05:33 UTC
From: davidhooau
Topic: 7709 Message: 7714

Scotty and Sam,

Many thanks for your assistance. I'm relieved to hear that the droop isn't a show stopper (yet).

I've just checked the levels, and don't see a huge problem. All of my mixers measured around the 10dB loss mark (no I don't know why it's so high), so I have:

PLO (8dBM) -> MXR4 atten (14dB) -> ADE-11X (10dB) -> XF (4.6dB) = -20.6dBm

So I'm not too far out.

I did the initial LD/ADC cal using an HP3325A (which was last calibrated around the time of the French revolution) and will check it against Sam's leveler and an HP355D attenuator. The MFC has also changed since the initial test, so maybe I've bumped something in the process of putting the SLIMs into their little cases.

Nearly time to build the cavity filter!

Cheers,

davidh

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I was focusing on the droop rather than the absolute level, so I didn't notice the low signal level that Scotty points out. You probably need to resolve that before worrying about the droop.
> Sam W.
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> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
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> > Â I need to do some work on the Integration and Verification Test Procedure web page.
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> > I will look at this a little closer tomorrow.
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> > --- On Tue, 2/22/11, davidhooau <dhooke@> wrote:

> >
> > From: davidhooau <dhooke@>
> > Subject: [spectrumanalyzer] PDM and Range Tests
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Tuesday, February 22, 2011, 4:51 PM
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> > Thanks,
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> > davidh
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7715. Taming the zero response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-23 23:39:24 UTC
From: Sam
Topic: 7715 Message: 7715

The zero response--the hump that appears around 0 Hz when there is no input signal--extends up to at least 1 MHz in VNA modes due to leakage of LO3 through Mixer 3 into LO2. The board Jim recently ordered has an isolation amplifier to insert in the line from LO2 to Mixer 3 to reduce that leakage. I got anxious to try this out, so instead of an amplifier I used an isolator (Teledyne, 950-1150 MHz, of which many are available on eBay). The isolator is a ferrite device that allows signal to pass from port 1 to port 2, but any signal entering port 2 gets routed to port 3, which in an isolator is terminated in 50 ohms. So it allows LO2 to get to Mixer 3 but does not allow LO3 to go in the reverse direction.

It works like a charm. My zero response in VNA modes now drops below -100 dBm at about 200 kHz. It used to take until 1 MHz to drop that low.

The isolator is a nice solution if you have the room (it's about 1.75" square), and doesn't require any power. The amp likely will provide better isolation, though this is pretty darn good (30 dB isolation).

Sam W.

7716. GROUP BUY FILTERS PLUS MAILING

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-24 01:26:42 UTC
From: jghbeta
Topic: 7716 Message: 7716

US, Brazil & Australia boxes where mailed today Feb 23.
Canada, France, Germany, New Zealand, Sweden and the UK will be mailed tomorrow Feb 24.
That will complete the Group Buy. Over and out and enjoy.

Jim W1JGH

7717. Re: [spectrumanalyzer] Taming the zero response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-24 10:21:29 UTC
From: Jurgen
Topic: 7715 Message: 7717

Sam, do you have an Ebay item number, Thanks, Jurgen

On 2/23/2011 6:39 PM, Sam wrote:
>
> The zero response--the hump that appears around 0 Hz when there is no
> input signal--extends up to at least 1 MHz in VNA modes due to leakage
> of LO3 through Mixer 3 into LO2. The board Jim recently ordered has an
> isolation amplifier to insert in the line from LO2 to Mixer 3 to
> reduce that leakage. I got anxious to try this out, so instead of an
> amplifier I used an isolator (Teledyne, 950-1150 MHz, of which many
> are available on eBay). The isolator is a ferrite device that allows
> signal to pass from port 1 to port 2, but any signal entering port 2
> gets routed to port 3, which in an isolator is terminated in 50 ohms.
> So it allows LO2 to get to Mixer 3 but does not allow LO3 to go in the
> reverse direction.
>
> It works like a charm. My zero response in VNA modes now drops below
> -100 dBm at about 200 kHz. It used to take until 1 MHz to drop that low.
>
> The isolator is a nice solution if you have the room (it's about 1.75"
> square), and doesn't require any power. The amp likely will provide
> better isolation, though this is pretty darn good (30 dB isolation).
>
> Sam W.
>
>

7718. Re: Taming the zero response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-24 15:15:25 UTC
From: Sam
Topic: 7715 Message: 7718

<http://cgi.ebay.com/Teledyne-C-1S13T-3-Circulator-950-1150MHz-20dB-Isolat-/300429680576?pt=LH_DefaultDomain_0&hash=item45f3011fc0>

5 are available. This is actually a circulator, so you have to add a 50-ohm termination to port 3 (which is shown in the photo but I don't know if it is part of the sale). It looks like it might be slightly bigger than mine.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> Sam, do you have an Ebay item number, Thanks, Jurgen
>
>
>
> On 2/23/2011 6:39 PM, Sam wrote:
> >
> > The zero response--the hump that appears around 0 Hz when there is no
> > input signal--extends up to at least 1 MHz in VNA modes due to leakage
> > of LO3 through Mixer 3 into LO2. The board Jim recently ordered has an
> > isolation amplifier to insert in the line from LO2 to Mixer 3 to
> > reduce that leakage. I got anxious to try this out, so instead of an
> > amplifier I used an isolator (Teledyne, 950-1150 MHz, of which many
> > are available on eBay). The isolator is a ferrite device that allows
> > signal to pass from port 1 to port 2, but any signal entering port 2
> > gets routed to port 3, which in an isolator is terminated in 50 ohms.
> > So it allows LO2 to get to Mixer 3 but does not allow LO3 to go in the
> > reverse direction.
> >
> > It works like a charm. My zero response in VNA modes now drops below
> > -100 dBm at about 200 kHz. It used to take until 1 MHz to drop that low.
> >
> > The isolator is a nice solution if you have the room (it's about 1.75"
> > square), and doesn't require any power. The amp likely will provide
> > better isolation, though this is pretty darn good (30 dB isolation).
> >
> > Sam W.
> >
> >
>

7719. Re: Taming the zero response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-24 18:32:33 UTC
From: ke7axc
Topic: 7715 Message: 7719

I bought one of those and it came with the termination. It arrived, but I haven't tried to use it. Most of my electronic stuff has been moved to my new house, but I'm still at the old one and don't know when I'll get around to it.
Alan

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> <http://cgi.ebay.com/Teledyne-C-1S13T-3-Circulator-950-1150MHz-20dB-Isolat-/300429680576?pt=LH_DefaultDomain_0&hash=item45f3011fc0>
>
> 5 are available. This is actually a circulator, so you have to add a 50-ohm termination to port 3 (which is shown in the photo but I don't know if it is part of the sale). It looks like it might be slightly bigger than mine.
>
> Sam W.
>

7720. Re: [spectrumanalyzer] Re: Taming the zero response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-24 19:53:30 UTC
From: william sprowls
Topic: 7715 Message: 7720

Hi All,
 Just as small warning to those of us who have pacemakers. Isolators/Circulators have a powerful magnet inside. Although the case shields the magnetic field, it ain't perfect. Don't use one as a necklace.
 You can actually change its RF characteristics a little by adding another magnet on its outside. These things are "voodoo". Lotsa fun to play with.
Scotty

--- On Thu, 2/24/11, ke7axc <alanh137@...> wrote:

From: ke7axc <alanh137@...>
Subject: [spectrumanalyzer] Re: Taming the zero response
To: spectrumanalyzer@yahoogroups.com
Date: Thursday, February 24, 2011, 12:32 PM

I bought one of those and it came with the termination. It arrived, but I haven't tried to use it. Most of my electronic stuff has been moved to my new house, but I'm still at the old one and don't know when I'll get around to it.

Alan

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:

>

> <http://cgi.ebay.com/Teledyne-C-1S13T-3-Circulator-950-1150MHz-20dB-Isolat-/300429680576?pt=LH_DefaultDomain_0&hash=item45f3011fc0>

>

> 5 are available. This is actually a circulator, so you have to add a 50-ohm termination to port 3 (which is shown in the photo but I don't know if it is part of the sale). It looks like it might be slightly bigger than mine.

>

> Sam W.

>

7721. crystal filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-24 20:43:36 UTC
From: mcmurraygrouch57
Topic: 4254 Message: 7721

```
got sams crystal filter zip and cant open the one labeled xtal slim 5 stage.any ideas.
ron
```

7722. Re: crystal filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-25 19:33:12 UTC
From: Sam
Topic: 4254 Message: 7722

What is the actual name of the zip file and the contained file that won't open? I think Jim did the 5 stage layout.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "mcmurraygrouch57" <hamshack@...> wrote:
>
> got sams crystal filter zip and cant open the one labeled xtal slim 5 stage.any ideas.
> ron
>

7723. Re: crystal filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-26 01:16:06 UTC
From: mcmurraygrouch57
Topic: 4254 Message: 7723

xtalfilt2zip
xtalsim_5stage
ron

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> What is the actual name of the zip file and the contained file that won't open? I think Jim did the 5 stage layout.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "mcmurraygrouch57" <hamshack@> wrote:
> >
> > got sams crystal filter zip and cant open the one labeled xtal slim 5 stage.any ideas.
> > ron
> >
>

7724. Re: crystal filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-26 13:24:53 UTC
From: Sam
Topic: 4254 Message: 7724

Actually, they are XtalFilt2.zip and XtalSim_5stage.cct. The .cct file is an RFSim99 simulation file. Do you have RFSim99 installed?
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "mcmurraygrouch57" <hamshack@...> wrote:
>
> xtalfilt2zip
> xtalsim_5stage
> ron
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > What is the actual name of the zip file and the contained file that won't open? I think Jim did the 5 stage layout.
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "mcmurraygrouch57" <hamshack@> wrote:
> > >
> > > got sams crystal filter zip and cant open the one labeled xtal slim 5 stage.any ideas.
> > > ron
> > >
> >
>

7725. Re: [spectrumanalyzer] Board Group Buy [2 Attachments]

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-26 19:33:27 UTC
From: Steve
Topic: 7575 Message: 7725

Jim,

Received the MSA filter-plus PWB this week. Thanks for organizing the buy.

Did the two documents in your email below get revised when the diplexer
and zero response zapper were added to the board? If so, I evidently
missed them. Where could I find them?

Just trying to acquire the PWB documentation so I'll have it when I want
to use the board.

73,

Steve K8JQ

On 2/5/2011 10:07 PM, Jim Hontoria wrote:
> [Attachment(s) <#TopText> from Jim Hontoria included below]
>
> Hi everyone:
> Please see attached two documents: One of them contains a description
> of the February 2011 group buy (this very same), the other one has all
> the individual pcb and sch files. This group buy started as filter
> collection but by popular demand has grown t something larger. In
> summary what we have is a board consisting on the following:
>
> 2each 5 pole filters
>
> 1 each 4 pole filter
>
> 1 each amplifilter
>
> 2 each ceramic filters
>
> 4 each lo/hi pass filters
>
> 1 step recovery diode board
>
> 1 each updated video filter switch board
>
> 1 each updated W1JGH power meter
>
> 1 each Hi-Impedance bridge
>
> 1 VGA board for log detector
>
> 1 High isolation SPDT

>
> 1 VHF Transmission/Reflection switch
>
> 1 AADE accessory board to measure SMDs
>
> Some boards are entirely new, others are updates and a good number of
> them are experimental.
>
> Read the attached documentation for further details and how to order.
>
> (Sorry for the highlighting, I don't seem to be avble to get rid of it)
>
>
> Jim W1JGH
>
>
> Attachment(s) from Jim Hontoria
>
> 2 of 2 File(s)
>
> Feb11 MSA Group Buy Files.zip
> <http://xa.yimg.com/kq/groups/11973596/1947647700/name/Feb11%20MSA%20Group%20Buy%20Files
%2Ezip>
> Feb11 MSA Group Buy.zip
> <http://xa.yimg.com/kq/groups/11973596/2017205051/name/Feb11%20MSA%20Group%20Buy%2Ezip>
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Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

7726. Re: [spectrumanalyzer] Board Group Buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-26 19:45:29 UTC
From: Jim Hontoria
Topic: 7575 Message: 7726

The diplexer documentation is in Sam Weterlin's web site.
The "zapper" is at Scotty's. I think he calls it the zero reponse buffer amplifier and it is the same boardas the IF amplifier but with different components.

Jim

On Sat, Feb 26, 2011 at 2:33 PM, Steve <steve65@...> wrote:

>
>
> Jim,
>
> Received the MSA filter-plus PWB this week. Thanks for organizing the buy.
>
> Did the two documents in your email below get revised when the diplexer
> and zero response zapper were added to the board? If so, I evidently
> missed them. Where could I find them?
>
> Just trying to acquire the PWB documentation so I'll have it when I want
> to use the board.
>
> 73,
>
> Steve K8JQ
>
> On 2/5/2011 10:07 PM, Jim Hontoria wrote:
> > [Attachment(s) <#TopText> from Jim Hontoria included below]
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> > Hi everyone:
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>

--
Jim G. Hontoria

7727. LO2 isolation amp and TG buffer amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-26 20:08:52 UTC
From: Sam
Topic: 7727 Message: 7727

Jim's filter board, which I just received (thanks, Jim) contains my isolation amp designed to insert between PLO2 and Mixer 3. I have also mentioned that I use an amp on the output of Mixer 3 (the TG) to improve the return loss and prevent a DUT from selectively re-reflecting high frequency signals (LO2 and LO3) back into the mixer.

Jim also included Scotty's amp board on this recent buy. Scotty has proposed using one side of that board for the LO2 isolation amp. It occurred to me that you could use Scotty's buffer amp board to get both amps on a single board. The catch is that the TG buffer amp must replace the MMIC inductor with a size 1206 resistor (or maybe two such resistors in parallel), but it appears that it will fit--perhaps sitting on its side.

Some isolation is necessary between the amps, but I think a shield down the middle would be adequate (even though it needs a hole in it for the power input). There is no fear of contamination of the TG signal by LO2--it already contains LO2. But we don't want PLO2 contaminated by LO3 (that's the whole point of the isolation amp). The LO3 level in the TG amp output will be maybe -20 dBm, and has to make it through the fence to the LO2 amp input in order to work its way back to PLO2 before it causes any trouble.

I posted a schematic and PCB for this combined amplifier (not yet built/tested), which I call the Mixer 3 Amps, in the Files section:

<http://groups.yahoo.com/group/spectrumanalyzer/files/Mixer3Amps.zip>

Sam W.

7728. Re: Board Group Buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-26 21:31:47 UTC
From: Sam
Topic: 7575 Message: 7728

On the topic of the diplexer: It contains an attenuator that was intended to approximate in 2G the loss that occurs in 1G when the signal passes through the cavity filter and Mixer 2, which get bypassed by the 10.7 MHz signal in 2G. If you don't do that, it may be possible for the 2G signal to overload the IF amplifier.

I believe I originally counted on some attenuation occurring at the Mixer 1 output, where the 10.7 MHz signal has to pass through a small capacitor (100 pF I believe), so I made the resistive attenuator a bit smaller than it would otherwise have to be. Later on, I think I replaced the Mixer 1 output capacitor with a larger one, but never tweaked the diplexer attenuator. That was all long ago.

Bottom line, it's up to you to figure out the proper attenuation in the diplexer.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> The diplexer documentation is in Sam Weterlin's web site.
> The "zapper" is at Scotty's. I think he calls it the zero reponse buffer
> amplifier and it is the same boardas the IF amplifier but with different
> components.
>
> Jim
>
>
> On Sat, Feb 26, 2011 at 2:33 PM, Steve <steve65@...> wrote:
>
> >
> >
> > Jim,
> >
> > Received the MSA filter-plus PWB this week. Thanks for organizing the buy.
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> > Did the two documents in your email below get revised when the diplexer
> > and zero response zapper were added to the board? If so, I evidently
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> > Just trying to acquire the PWB documentation so I'll have it when I want
> > to use the board.
> >
> > 73,
> >
> > Steve K8JQ
> >
> > On 2/5/2011 10:07 PM, Jim Hontoria wrote:
> > > [Attachment(s) <#TopText> from Jim Hontoria included below]

> > >
> > > Hi everyone:
> > > Please see attached two documents: One of them contains a description
> > > of the February 2011 group buy (this very same), the other one has all
> > > the individual pcb and sch files. This group buy started as filter
> > > collection but by popular demand has grown t something larger. In
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> > > Read the attached documentation for further details and how to order.
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> --
> Jim G. Hontoria
>

7729. Re: crystal filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-26 23:00:12 UTC
From: ron
Topic: 4254 Message: 7729

thanks sam didnt think to try rf sim.
ron

7730. Re: [spectrumanalyzer] LO2 isolation amp and TG buffer amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-26 23:08:03 UTC
From: william sprowls
Topic: 7727 Message: 7730

Hi All,
 As a note, I have revised the Block Diagram and Wiring Harness to include the optional Buffer/Amplifier between PLO 2 and Mixer 3. Although this addition will improve the isolation of PLO 2, it really is optional. Some builders may not be interested in the addition.
see:
http://www.scottyspectrumanalyzer.com/msaslim.html
This is the Web page for the Construction of the MSA. You may notice that I have deleted the two wiring diagrams for the Basic MSA and MSA with Tracking Generator. There are new notes on determining the requirements for wiring.
Scotty

--- On Sat, 2/26/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] LO2 isolation amp and TG buffer amp
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, February 26, 2011, 2:08 PM

Jim's filter board, which I just received (thanks, Jim) contains my isolation amp designed to insert between PLO2 and Mixer 3. I have also mentioned that I use an amp on the output of Mixer 3 (the TG) to improve the return loss and prevent a DUT from selectively re-reflecting high frequency signals (LO2 and LO3) back into the mixer.

Jim also included Scotty's amp board on this recent buy. Scotty has proposed using one side of that board for the LO2 isolation amp. It occurred to me that you could use Scotty's buffer amp board to get both amps on a single board. The catch is that the TG buffer amp must replace the MMIC inductor with a size 1206 resistor (or maybe two such resistors in parallel), but it appears that it will fit--perhaps sitting on its side.

Some isolation is necessary between the amps, but I think a shield down the middle would be adequate (even though it needs a hole in it for the power input). There is no fear of contamination of the TG signal by LO2--it already contains LO2. But we don't want PLO2 contaminated by LO3 (that's the whole point of the isolation amp). The LO3 level in the TG amp output will be maybe -20 dBm, and has to make it through the fence to the LO2 amp input in order to work its way back to PLO2 before it causes any trouble.

I posted a schematic and PCB for this combined amplifier (not yet built/tested), which I call the Mixer 3 Amps, in the Files section:

<http://groups.yahoo.com/group/spectrumanalyzer/files/Mixer3Amps.zip>

Sam W.

7731. Re: crystal filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-27 00:28:22 UTC
From: Sam
Topic: 4254 Message: 7731

That file allows simulation of a 5-xtal filter, with different crystal parameters for each. It's a bit of a pain to enter the values (RFSim99 only allows so many significant digits; to get more you have to use two series inductors or two parallel capacitors, one big and one small), but once you have the data entered you can play with it as much as you want. That lets you see how well a particular set of filters (which you test with Crystal Analysis) will actually perform in a circuit that was designed using a single set of specs for all crystals. It also lets you tinker with the coupling components. Each crystal (except one, I think) has a series capacitor used to tweak its frequency (lower capacitance raises the frequency), so if you have a crystal for which you know the frequency is low, you can try lowering the series capacitance.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, ron <hamshack@...> wrote:
>
> thanks sam didnt think to try rf sim.
> ron
>

7732. Re: LO2 isolation amp and TG buffer amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-27 00:58:50 UTC
From: Sam
Topic: 7727 Message: 7732

It is absolutely true that these amps are optional. You don't need to even think about them until your MSA is up and running, other than perhaps reserving space for them. I think the isolation amplifier is a great idea, but I've been operating the MSA just fine for a couple of years without one.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi All,
> Â As a note, I have revised the Block Diagram and Wiring Harness to include the optional Buffer/Amplifier between PLO 2 and Mixer 3. Although this addition will improve the isolation of PLO 2, it really is optional. Some builders may not be interested in the addition.
> see:
> http://www.scottyspectrumanalyzer.com/msaslim.html
> This is the Web page for the Construction of the MSA. You may notice that I have deleted the two wiring diagrams for the Basic MSA and MSA with Tracking Generator. There are new notes on determining the requirements for wiring.
> Scotty
>
> --- On Sat, 2/26/11, Sam <swetterlin@...> wrote:
>
> From: Sam <swetterlin@...>
> Subject: [spectrumanalyzer] LO2 isolation amp and TG buffer amp
> To: spectrumanalyzer@yahoogroups.com
> Date: Saturday, February 26, 2011, 2:08 PM
>
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>
>
> Jim also included Scotty's amp board on this recent buy. Scotty has proposed using one side of that board for the LO2 isolation amp. It occurred to me that you could use Scotty's buffer amp board to get both amps on a single board. The catch is that the TG buffer amp must replace the MMIC inductor with a size 1206 resistor (or maybe two such resistors in parallel), but it appears that it will fit--perhaps sitting on its side.
>
>
>
> Some isolation is necessary between the amps, but I think a shield down the middle would be adequate (even though it needs a hole in it for the power input). There is no fear of contamination of the TG signal by LO2--it already contains LO2. But we don't want PLO2 contaminated by LO3 (that's the whole point of the isolation amp). The LO3 level in the TG amp output will be maybe -20 dBm, and has to make it through the fence to the LO2 amp input in order to work its way back to PLO2 before it causes any trouble.
>
>
>
> I posted a schematic and PCB for this combined amplifier (not yet built/tested), which I call the Mixer 3 Amps, in the Files section:
>
>
>
> <http://groups.yahoo.com/group/spectrumanalyzer/files/Mixer3Amps.zip>
>
>
>
> Sam W.
>

7733. LD coarse cal (test as you build)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-27 09:07:57 UTC
From: davidhooau
Topic: 7733 Message: 7733

Folks,

There's part of the LD coarse cal which I either don't understand (or disagree with).

Looking at the AD8306 data-sheet, in particular figures 8 and 11 on page 5, shows the 10MHz response falling away at about -90dBV (about -102dBm at the transformer input). This matches the tests I've done, where I'm seeing the gain start to flatten out at around -90dBm and pretty much fall off the cliff at -100dBm.

The TAYB procedure sets up a path 1 cal file using the "loaded" log detector noise floor and sets this ADC value to -116dBm. This is the almost same ADC value I'm seeing for -100dBm signals, and as a consequence, there's a considerable slope error between the -8dBm point from DDS1 J3 down to this basement level.

When I re-cal using an additional point below the level expected during the mixer tests, I have found most of the mysterious 2dB of mixer loss from previous tests has been rediscovered (sadly not all of it yet).

Have I missed something obvious? Or, is it worthwhile changing the TAYB to ask for an additional measurement using an attenuator, or should the current -116dBm value be changed to something around the -100dBm mark?

Thanks,

davidh

7734. Re: LD coarse cal (test as you build)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-27 14:37:33 UTC
From: Sam
Topic: 7733 Message: 7734

I'll leave the -116/-100 dBm issue for Scotty, but I'll address a related issue.

Since the bottom calibration point is at or near the noise floor, the true graph of dBm (y axis) vs ADC (x axis) will be very steep at the low end and then reach a stable slope on its way to the -8 dBm cal point. But the software will use a fairly straight line between the two points (not quite straight, because cubic interpolation is used). The line used by the software is thus below the true line, and dBm values below -8 dBm are under-estimated.

An extra calibration point would improve the results, but I believe Scotty was trying to get a coarse calibration that did not depend on using a signal generator. The results using coarse calibration between -8 dBm and +11 dBm should be pretty good.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Folks,
>
> There's part of the LD coarse cal which I either don't understand (or disagree with).
>
> Looking at the AD8306 data-sheet, in particular figures 8 and 11 on page 5, shows the 10MHz response falling away at about -90dBV (about -102dBm at the transformer input). This matches the tests I've done, where I'm seeing the gain start to flatten out at around -90dBm and pretty much fall off the cliff at -100dBm.
>
> The TAYB procedure sets up a path 1 cal file using the "loaded" log detector noise floor and sets this ADC value to -116dBm. This is the almost same ADC value I'm seeing for -100dBm signals, and as a consequence, there's a considerable slope error between the -8dBm point from DDS1 J3 down to this basement level.
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> When I re-cal using an additional point below the level expected during the mixer tests, I have found most of the mysterious 2dB of mixer loss from previous tests has been rediscovered (sadly not all of it yet).
>
> Have I missed something obvious? Or, is it worthwhile changing the TAYB to ask for an additional measurement using an attenuator, or should the current -116dBm value be changed to something around the -100dBm mark?
>
> Thanks,
>
> davidh
>

7735. Re: [spectrumanalyzer] LD coarse cal (test as you build)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-27 15:09:40 UTC
From: william sprowls
Topic: 7733 Message: 7735

Hi David,
 You bring up a good concern. What would be best is supply the MSA software with some pre-loaded values that conform to a completed log detector module. I would also like the same type of data for a completed MSA (front end input vs Magnitude bit count). We "sorta" have the latter in the Path 1 pre-loaded table. But it is too coarse. I will perform a calibration of the Log Detector and create a table and use it for a pre-load for Path 2. This will help builders who are testing as they build.
  If you (or anyone) would like to, perform a Mag Cal on your Log Detector and send me the results to compare to what I get. Use 10.7 MHz +/- 1 MHz. Go from +15 dBm (or as high as you can) to -110 dBm in 5 dB or 10 dB steps (or finer steps if convenient to you). Your table will be LD input power (in dBm) vs. Magnitude bit count. Of course, the Magdata is available in the Variables Window.
Scotty

--- On Sun, 2/27/11, davidhooau <dhooke@...> wrote:

From: davidhooau <dhooke@...>
Subject: [spectrumanalyzer] LD coarse cal (test as you build)
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, February 27, 2011, 3:07 AM

Folks,

There's part of the LD coarse cal which I either don't understand (or disagree with).

Looking at the AD8306 data-sheet, in particular figures 8 and 11 on page 5, shows the 10MHz response falling away at about -90dBV (about -102dBm at the transformer input). This matches the tests I've done, where I'm seeing the gain start to flatten out at around -90dBm and pretty much fall off the cliff at -100dBm.

The TAYB procedure sets up a path 1 cal file using the "loaded" log detector noise floor and sets this ADC value to -116dBm. This is the almost same ADC value I'm seeing for -100dBm signals, and as a consequence, there's a considerable slope error between the -8dBm point from DDS1 J3 down to this basement level.

When I re-cal using an additional point below the level expected during the mixer tests, I have found most of the mysterious 2dB of mixer loss from previous tests has been rediscovered (sadly not all of it yet).

Have I missed something obvious? Or, is it worthwhile changing the TAYB to ask for an additional measurement using an attenuator, or should the current -116dBm value be changed to something around the -100dBm mark?

Thanks,

davidh

7736. Re: LD coarse cal (test as you build)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-27 16:21:58 UTC
From: Sam
Topic: 7733 Message: 7736

Scotty,
Good idea to create a standard table, but I don't think it requires a whole lot of points, since the log detector specs allow +/-2.5% variation in slope (mV/dB) and +/-1.5% in intercept, so there will be errors anyway.

I'm also curious about the -116 dBm noise floor level. Sounds like David would have pegged the noise floor at -100 dBm. Below -100 dBm are getting ADC changes on the order of 1 bit per dB?

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi David,
> Â You bring up a good concern. What would be best is supply the MSA software with some pre-loaded values that conform to a completed log detector module. I would also like the same type of data for a completed MSA (front end input vs Magnitude bit count). We "sorta" have the latter in the Path 1 pre-loaded table. But it is too coarse. I will perform a calibration of the Log Detector and create a table and use it for a pre-load for Path 2. This will help builders who are testing as they build.
> Â If you (or anyone) would like to, perform a Mag Cal on your Log Detector and send me the results to compare to what I get. Use 10.7 MHz +/- 1 MHz. Go from +15 dBm (or as high as you can) to -110 dBm in 5 dB or 10 dB steps (or finer steps if convenient to you). Your table will be LD input power (in dBm) vs. Magnitude bit count. Of course, the Magdata is available in the Variables Window.
> Scotty
>
> --- On Sun, 2/27/11, davidhooau <dhooke@...> wrote:
>
> From: davidhooau <dhooke@...>
> Subject: [spectrumanalyzer] LD coarse cal (test as you build)
> To: spectrumanalyzer@yahoogroups.com
> Date: Sunday, February 27, 2011, 3:07 AM
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> Folks,
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> There's part of the LD coarse cal which I either don't understand (or disagree with).
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>
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>
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>
> The TAYB procedure sets up a path 1 cal file using the "loaded" log detector noise floor and sets this ADC value to -116dBm. This is the almost same ADC value I'm seeing for -100dBm signals, and as a consequence, there's a considerable slope error between the -8dBm point from DDS1 J3 down to this basement level.
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>
> When I re-cal using an additional point below the level expected during the mixer tests, I have found most of the mysterious 2dB of mixer loss from previous tests has been rediscovered (sadly not all of it yet).
>
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>
> Have I missed something obvious? Or, is it worthwhile changing the TAYB to ask for an additional measurement using an attenuator, or should the current -116dBm value be changed to something around the -100dBm mark?
>
>
>
> Thanks,
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>
>
> davidh
>

7737. Re: LD coarse cal (test as you build)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-27 18:53:33 UTC
From: davidhooau
Topic: 7733 Message: 7737

Howdy Scotty,

Below is the table generated using an un-cal'd 3325A as a signal source and 355D switched attenuator. My ADC reference is 4.9751V.

I have to travel for the next week, but will repeat the tests on my return, as my LD appears to be outside the data-sheet specs (from 0 to -10dBm I see 211mV/10dB).

Many thanks.

davidh

*Filter Path 1: CenterFreq=10.700000 MHz; Bandwidth=30.700000 KHz
*Calibrated 02/20/11 at 10.700000 MHz.
CalVersion= 1.03
MagTable=
* ADC dbm Phase in increasing order of ADC
4818 -110.000 0.00
4897 -100.000 0.00
5274 -90.000 0.00
7082 -80.000 0.00
9716 -70.000 0.00
12362 -60.000 0.00
15031 -50.000 0.00
17700 -40.000 0.00
20374 -30.000 0.00
23071 -20.000 0.00
25842 -10.000 0.00
28625 0.000 0.00
31386 10.000 0.00
32937 11.000 0.00

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi David,
> Â You bring up a good concern. What would be best is supply the MSA software with some pre-loaded values that conform to a completed log detector module. I would also like the same type of data for a completed MSA (front end input vs Magnitude bit count). We "sorta" have the latter in the Path 1 pre-loaded table. But it is too coarse. I will perform a calibration of the Log Detector and create a table and use it for a pre-load for Path 2. This will help builders who are testing as they build.
> Â If you (or anyone) would like to, perform a Mag Cal on your Log Detector and send me the results to compare to what I get. Use 10.7 MHz +/- 1 MHz. Go from +15 dBm (or as high as you can) to -110 dBm in 5 dB or 10 dB steps (or finer steps if convenient to you). Your table will be LD input power (in dBm) vs. Magnitude bit count. Of course, the Magdata is available in the Variables Window.

> Scotty
>
> --- On Sun, 2/27/11, davidhooau <dhooke@...> wrote:
>
> From: davidhooau <dhooke@...>
> Subject: [spectrumanalyzer] LD coarse cal (test as you build)
> To: spectrumanalyzer@yahoogroups.com
> Date: Sunday, February 27, 2011, 3:07 AM
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> Folks,
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> There's part of the LD coarse cal which I either don't understand (or disagree with).
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> Looking at the AD8306 data-sheet, in particular figures 8 and 11 on page 5, shows the 10MHz response falling away at about -90dBV (about -102dBm at the transformer input). This matches the tests I've done, where I'm seeing the gain start to flatten out at around -90dBm and pretty much fall off the cliff at -100dBm.
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>
> The TAYB procedure sets up a path 1 cal file using the "loaded" log detector noise floor and sets this ADC value to -116dBm. This is the almost same ADC value I'm seeing for -100dBm signals, and as a consequence, there's a considerable slope error between the -8dBm point from DDS1 J3 down to this basement level.
>
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>
> When I re-cal using an additional point below the level expected during the mixer tests, I have found most of the mysterious 2dB of mixer loss from previous tests has been rediscovered (sadly not all of it yet).

>
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>
> Have I missed something obvious? Or, is it worthwhile changing the TAYB to ask for an additional measurement using an attenuator, or should the current -116dBm value be changed to something around the -100dBm mark?
>
>
>
> Thanks,
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>
>
> davidh
>

7738. Re: Taming the zero response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-28 15:21:27 UTC
From: Greg Broburg
Topic: 7715 Message: 7738

The magnetically activated reed switch in the pacer is
intended to force the pulse output into the uninhibited
program rate. It's intended for a physician to be able
to observe the programmed pacing interval if there is
enough normal activity to inhibit. Most patients pacers
are inhibited a lot, waiting for a missing beat. Also,
there may be a programmed rate change for low battery.

You gotta get awfully close and in the correct field
orientation with the magnet from the pacer can in order
to activate the switch.

Greg

On 2/24/2011 1:53 PM, william sprowls wrote:
>
> Hi All,
> Just as small warning to those of us who have pacemakers.
> Isolators/Circulators have a powerful magnet inside. Although the case
> shields the magnetic field, it ain't perfect. Don't use one as a necklace.
> You can actually change its RF characteristics a little by adding
> another magnet on its outside. These things are "voodoo". Lotsa fun to
> play with.
> Scotty
>
> --- On *Thu, 2/24/11, ke7axc /<alanh137@...>/* wrote:
>
>
> From: ke7axc <alanh137@...>
> Subject: [spectrumanalyzer] Re: Taming the zero response
> To: spectrumanalyzer@yahoogroups.com
> Date: Thursday, February 24, 2011, 12:32 PM
>
> I bought one of those and it came with the termination. It
> arrived, but I haven't tried to use it. Most of my electronic
> stuff has been moved to my new house, but I'm still at the old one
> and don't know when I'll get around to it.
> Alan
>
> --- In spectrumanalyzer@yahoogroups.com
> </mc/compose?to=spectrumanalyzer%40yahoogroups.com>, "Sam"
> <swetterlin@...> wrote:
> >
> >
> <http://cgi.ebay.com/Teledyne-C-1S13T-3-Circulator-950-1150MHz-20dB-Isolat-/300429680576
?pt=LH_DefaultDomain_0&hash=item45f3011fc0

> <http://cgi.ebay.com/Teledyne-C-1S13T-3-Circulator-950-1150MHz-20dB-Isolat-/300429680576
?pt=LH_DefaultDomain_0&hash=item45f3011fc0>>
> >
> > 5 are available. This is actually a circulator, so you have to
> add a 50-ohm termination to port 3 (which is shown in the photo
> but I don't know if it is part of the sale). It looks like it
> might be slightly bigger than mine.
> >
> > Sam W.
> >
>
>
>

7739. Re: [spectrumanalyzer] Re: LD coarse cal (test as you build)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-28 16:35:42 UTC
From: william sprowls
Topic: 7733 Message: 7739

Hi David,
 After comparing your Log Detector data to the Verification MSA's Log Detector:
1. Your slope between linear points (+10 dBm to -80 dBm) averages 20.67 mv/dB. My slope is 20.55 mv/db. This is only a difference error of 0.6%. With these two data sets, one can use an average slope (among various Log Detectors) of 20.61 mv/dB. The slope of the Log Det is slightly affected by Vcc.
2. With the 16 bit AtoD, this is an average slope of 270.1 bits/dB.
3. Your data at 0 dBm is 1.1 dB different than the Verif MSA. However, you stated your 3325 is uncalibrated, and my source was calibrated. So, one can assume that 0 dBm into a Log Detector should produce an output voltage of 2.16 volts, with a bit count of 28326. Using that value as a calibration point, there will be some error from unit to unit because the voltage output of the Log Det is also slightly affected by Vcc.
4. Your data point at +11 dBm looks bogus. I'll bet my paycheck (well, I don't get one anyway) that your data point is really +15 dBm or higher.

Bottom line to all this. If any builder would like a "pre-set" coarse calibration for the Log Detector and 16 Bit serial AtoD, do this:
1. If you don't have a path 2 filter, create one in the Hardware Configuration Manager using the same filter characteristics as the one in Path 1. If you do have a real filter to use in Path 2, you can use Path 3 or Path 4.
2. Open the Initial Cal Manager, and click the path 2 (or the path you want to use). This changes the table to Path Calibration Table.
3. Enter 3 sets of values:
ADC = 0, dbm = -104.91, Phase = 0
ADC = 28326, dbm = 0, Phase = 0
ADC = 65534, dbm = 137.81, Phase = 0
delete any other sets of values
4. Click Cleanup, then click Save File
 (Of course, the -104 and 137 dB points are not obtainable, but the values establish data points for the software to calculate "real" power inputs.)
5. From this point on, you can command the MSA to use Path 2 and the Magnitude will indicate the exact power on the input to the Log Detector, NOT the power input to the MSA. It should be fairly accurate (+/- .5dB) from +15 dB down to -80 dBm. Below -80, the Log Detector is operating in its non-linear area, but it will certainly indicate data. Due to some error from MSA to MSA ,your mileage may vary!
Scotty

--- On Sun, 2/27/11, davidhooau <dhooke@...> wrote:

From: davidhooau <dhooke@gmail.com>
Subject: [spectrumanalyzer] Re: LD coarse cal (test as you build)
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, February 27, 2011, 12:53 PM

Howdy Scotty,

Below is the table generated using an un-cal'd 3325A as a signal source and 355D switched attenuator. My ADC reference is 4.9751V.

I have to travel for the next week, but will repeat the tests on my return, as my LD appears to be outside the data-sheet specs (from 0 to -10dBm I see 211mV/10dB).

Many thanks.

davidh

*Filter Path 1: CenterFreq=10.700000 MHz; Bandwidth=30.700000 KHz

*Calibrated 02/20/11 at 10.700000 MHz.

CalVersion= 1.03

MagTable=

* ADC dbm Phase in increasing order of ADC

4818 -110.000 0.00

4897 -100.000 0.00

5274 -90.000 0.00

7082 -80.000 0.00

9716 -70.000 0.00

12362 -60.000 0.00

15031 -50.000 0.00

17700 -40.000 0.00

20374 -30.000 0.00

23071 -20.000 0.00

25842 -10.000 0.00

28625 0.000 0.00

31386 10.000 0.00

32937 11.000 0.00

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:

>

> Hi David,

> Â You bring up a good concern. What would be best is supply the MSA software with some pre-loaded values that conform to a completed log detector module. I would also like the same type of data for a completed MSA (front end input vs Magnitude bit count). We "sorta"

have the latter in the Path 1 pre-loaded table. But it is too coarse. I will perform a calibration of the Log Detector and create a table and use it for a pre-load for Path 2. This will help builders who are testing as they build.

> Â If you (or anyone) would like to, perform a Mag Cal on your Log Detector and send me the results to compare to what I get. Use 10.7 MHz +/- 1 MHz. Go from +15 dBm (or as high as you can) to -110 dBm in 5 dB or 10 dB steps (or finer steps if convenient to you). Your table will be LD input power (in dBm) vs. Magnitude bit count. Of course, the Magdata is available in the Variables Window.

> Scotty

>

> --- On Sun, 2/27/11, davidhooau <dhooke@...> wrote:

>

> From: davidhooau <dhooke@...>

> Subject: [spectrumanalyzer] LD coarse cal (test as you build)

> To: spectrumanalyzer@yahoogroups.com

> Date: Sunday, February 27, 2011, 3:07 AM

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> Folks,

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> There's part of the LD coarse cal which I either don't understand (or disagree with).

>

>

>

> Looking at the AD8306 data-sheet, in particular figures 8 and 11 on page 5, shows the 10MHz response falling away at about -90dBV (about -102dBm at the transformer input). This matches the tests I've done, where I'm seeing the gain start to flatten out at around -90dBm and pretty much fall off the cliff at -100dBm.

>

>

>

> The TAYB procedure sets up a path 1 cal file using the "loaded" log detector noise floor and sets this ADC value to -116dBm. This is the almost same ADC value I'm seeing for -100dBm signals, and as a consequence, there's a considerable slope error between the -8dBm point from DDS1 J3 down to this basement level.

>

>

>

> When I re-cal using an additional point below the level expected during the mixer tests, I have found most of the mysterious 2dB of mixer loss from previous tests has been rediscovered (sadly not all of it yet).

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>

>

> Have I missed something obvious? Or, is it worthwhile changing the TAYB to ask for an additional measurement using an attenuator, or should the current -116dBm value be changed to something around the -100dBm mark?

>

>

>

> Thanks,

>

>

>

> davidh

>

7740. Mixer 3 Amps

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-28 20:41:27 UTC
From: Sam
Topic: 7740 Message: 7740

I have built the "Mixer 3 Amps"--an LO2 isolation amp and an amp for the TG output. They are together on Scotty's IF amp PCB--the one included on Jim's board. Results are good. Both of them amplify properly. The LO2 isolation amp has a net gain of 0.5 dB (with 10 dBm input), and the TG amp has a net gain of 3 dB (with -10 dBm input). (The amps are mainly for isolation, not gain). I might reduce the input attenuator on the TG amp a bit.

I have no fencing whatsoever, and the isolation between the input of one amp and the output of the other is better than 70 dB at 1 GHz! (Good layout, Scotty.) I have not yet installed them in the MSA; I just tested them on the bench.

To make the 120 ohm resistor for the TG amp MMIC output, I used a size 1206, 220 ohm resistor installed in the normal manner, and a size 1206, 270 ohm resistor lying on its side next to the first one. There was plenty of room for this. I did it this way to improve heat dissipation over what it would be with the resistors stacked, or with a single 120 ohm resistor. In theory, a single size 1206, 120 ohm resistor could handle the heat (0.16 Watts), but I like to keep temperatures low. You probably could use some combination of side-by-side 0805 resistors, because there is plenty of room.

Sam W.

7741. Re: Mixer 3 Amps

Yahoo group: spectrumanalyzer (2011)
Date: 2011-02-28 22:28:53 UTC
From: Sam
Topic: 7740 Message: 7741

A little more info. The reverse isolation of the LO2 amp at 1 GHz is 40 dB. That's almost exactly what one would predict from the 16.5 dB attenuation plus 22 dB reverse isolation of the ERA-33SM. That means it will reduce by 40 dB the leakage of LO3 into LO2. I believe that is far more than I actually need.

A major purpose of the TG amp is to get good output return loss. Up to 150 MHz, the return loss is better than 40 dB (near 50 dB at some points), which is excellent. It declines to 20 dB at 1 GHz. It's a bit of a mystery to me why it declines that far, but 20 dB is still decent.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have built the "Mixer 3 Amps"--an LO2 isolation amp and an amp for the TG output. They are together on Scotty's IF amp PCB--the one included on Jim's board. Results are good. Both of them amplify properly. The LO2 isolation amp has a net gain of 0.5 dB (with 10 dBm input), and the TG amp has a net gain of 3 dB (with -10 dBm input). (The amps are mainly for isolation, not gain). I might reduce the input attenuator on the TG amp a bit.
>
> I have no fencing whatsoever, and the isolation between the input of one amp and the output of the other is better than 70 dB at 1 GHz! (Good layout, Scotty.) I have not yet installed them in the MSA; I just tested them on the bench.
>
> To make the 120 ohm resistor for the TG amp MMIC output, I used a size 1206, 220 ohm resistor installed in the normal manner, and a size 1206, 270 ohm resistor lying on its side next to the first one. There was plenty of room for this. I did it this way to improve heat dissipation over what it would be with the resistors stacked, or with a single 120 ohm resistor. In theory, a single size 1206, 120 ohm resistor could handle the heat (0.16 Watts), but I like to keep temperatures low. You probably could use some combination of side-by-side 0805 resistors, because there is plenty of room.
>
> Sam W.
>

7742. 11.155MHz crystals available in the UK

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-01 20:19:34 UTC
From: g3wie
Topic: 7742 Message: 7742

Hi All,

Recently I purchased about 80 pieces of 11.155MHz crystals via the UK fleabay. I got them for a song as no-one else was bidding, with the thought they may well be selectable for use in the ladder filters of recent fame on this list and as featured in a group buy pcb.

I'd like to make them available at zero cost apart from postage, in the same spirit as the previous huge batch which Scotty and Sam so valiantly tested (and of which I have some sets for my ssa). However they will require matching, and my ssa/vna is still in kit form. It's pretty much next on the project list and matching up a sets of crystals would be a good first use for it, as well as training for the operator. However, that will take some while to happen (realistically Christmas 2011). If anyone else would like to take up the challenge on a faster timescale, I'll happily ship the crystals along

73

Chris g3wie

7743. Re: 11.155MHz crystals available in the UK

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-01 23:41:52 UTC
From: Sam
Topic: 7742 Message: 7743

Nice offer. I can't take any credit for the previous testing of the 10.11 MHz crystals. That was Scotty and Jerry Barnett. Jerry actually provided the crystals.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "g3wie" <g3wie@...> wrote:
>
> Hi All,
>
> Recently I purchased about 80 pieces of 11.155MHz crystals via the UK fleabay. I got them for a song as no-one else was bidding, with the thought they may well be selectable for use in the ladder filters of recent fame on this list and as featured in a group buy pcb.
>
> I'd like to make them available at zero cost apart from postage, in the same spirit as the previous huge batch which Scotty and Sam so valiantly tested (and of which I have some sets for my ssa). However they will require matching, and my ssa/vna is still in kit form. It's pretty much next on the project list and matching up a sets of crystals would be a good first use for it, as well as training for the operator. However, that will take some while to happen (realistically Christmas 2011). If anyone else would like to take up the challenge on a faster timescale, I'll happily ship the crystals along
>
> 73
>
> Chris g3wie
>

7744. Re: 11.155MHz crystals available in the UK

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-02 01:12:44 UTC
From: undercoupled
Topic: 7742 Message: 7744

Hi Chris,

It takes a LOT of crystals to be able to match them closely. Scotty went through about 1000 crystals, and I went through about 2000, from a really good buy on Ebay . These are 10.111 MHz crystals. I still have several thousand left, unsorted, if anyone else wishes to tackle the job. The bigger the tested batch, the higher percentage yield of good matches. You might not get that many close sets from 80 crystals.

Jerry Barnett

--- In spectrumanalyzer@yahoogroups.com, "g3wie" <g3wie@...> wrote:
>
> Hi All,
>
> Recently I purchased about 80 pieces of 11.155MHz crystals via the UK fleabay. I got them for a song as no-one else was bidding, with the thought they may well be selectable for use in the ladder filters of recent fame on this list and as featured in a group buy pcb.
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>
> 73
>
> Chris g3wie
>

7745. Dillon's Scoreboard

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-02 04:12:57 UTC
From: william
Topic: 7745 Message: 7745

Hi All,
Ya'll might want to check out William Dillon's web site. His MSA is arranged as a "scoreboard". Great pictures.
http://alternet.us.com/?page_id=751
Cheers, Scotty

7746. How to merge PCB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-02 04:22:04 UTC
From: Lincheng Xiu
Topic: 7157 Message: 7746

Scotty
  How do you merge the Panel Rev E to one big PCB?
  I saw most of the module is grouped to one part, how did you do that?
Thanks
Lin

From: william sprowls <wsprowls@yahoo.com>
To: spectrumanalyzer@yahoogroups.com
Sent: Tue, November 30, 2010 7:54:27 PM
Subject: Re: [spectrumanalyzer] Re: MSA Noise floor

Hi Lin,
 Be sure to factor in the insertion loss of each filter. Perhaps the 7.5 KHz filter has more loss. A better reference to each other will be accurate once you have calibrated.
Scotty

--- On Tue, 11/30/10, inlinebeginner <inlinebeginner@...> wrote:

>From: inlinebeginner <inlinebeginner@...>
>Subject: [spectrumanalyzer] Re: MSA Noise floor
>To: spectrumanalyzer@yahoogroups.com
>Date: Tuesday, November 30, 2010, 8:10 PM
>
>
>
>After I put fence and lid on log detector, I got:
>-98dBm 1kHz RB
>-100.5dBm 7.5kHz RB
>-96.8dBm 61kHz RB
>-93.7dBm 1kHz RB
>What I could not explain is that the 7.5kHz filter get lower noise floor. It
>should be higher than 1kHz RB.
>Maybe the 1kHz filter frequency respond is not good enough?
>
>Lin
>
>
>

7747. Re: [spectrumanalyzer] How to merge PCB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-02 13:35:44 UTC
From: william sprowls
Topic: 7157 Message: 7747

Hi Lin,
I'm not sure of your question. The Rev E panel is one big panel. If you want to create a larger panel with other modules and include the Rev E panel, do this:
Open the Express .pcb of the PWB you want to include. "Copy" the whole pwb. Open the Express .pcb of the Rev E from the same application. "Paste" the pwb anywhere near, but not on top of what is already there. While it is highlighted, do a "Group". Then move it where you really want it. "Save" with a new name.
 To add another pwb, open it from the Rev E application and repeat the process.
You can move any of the pwb's around, but I caution you to make sure it is "Grouped". Otherwise, you may leave parts of it behind.
 Also, you should remove any text that refers to the new panel as Rev E. Give it a different name, such as "Lin-03-02-2011".
Scotty

--- On Tue, 3/1/11, Lincheng Xiu <inlinebeginner@...> wrote:

From: Lincheng Xiu <inlinebeginner@...>
Subject: [spectrumanalyzer] How to merge PCB
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, March 1, 2011, 10:22 PM

Scotty
  How do you merge the Panel Rev E to one big PCB?
  I saw most of the module is grouped to one part, how did you do that?
Thanks
Lin

From: william sprowls <wsprowls@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Tue, November 30, 2010 7:54:27 PM
Subject: Re: [spectrumanalyzer] Re: MSA Noise floor

Hi Lin,
 Be sure to factor in the insertion loss of each filter. Perhaps the 7.5 KHz filter has more loss. A better reference to each other will be accurate once you have calibrated.
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--- On Tue, 11/30/10, inlinebeginner <inlinebeginner@...> wrote:

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To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, November 30, 2010, 8:10 PM

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-98dBm 1kHz RB
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-93.7dBm 1kHz RB
What I could not explain is that the 7.5kHz filter get lower noise floor. It should be higher than 1kHz RB.
Maybe the 1kHz filter frequency respond is not good enough?

Lin

7748. Re: How to merge PCB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-02 13:57:28 UTC
From: Sam
Topic: 7157 Message: 7748

Lin,
If you are making a big panel you may also be thinking of getting solder mask/silkscreen. I don't know whether the Rev E panel was designed for that, so you may have to make changes. You need to block solder mask on the entire bottom. You also need to block it on the top around the perimeter of each board. If the perimeter ground plane is made with rectangles or filled plane, it will have solder mask. To block it, you need to use "pads" or explicitly use solder mask stop. Finally, the solder mask stop layers display separately from the trace layers, so if you select and copy or select and move, you can't copy/move everything at once, which is a bit awkward.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Lin,
> I'm not sure of your question. The Rev E panel is one big panel. If you want to create a larger panel with other modules and include the Rev E panel, do this:
> Open the Express .pcb of the PWB you want to include. "Copy" the whole pwb. Open the Express .pcb of the Rev E from the same application. "Paste" the pwb anywhere near, but not on top of what is already there. While it is highlighted, do a "Group". Then move it where you really want it. "Save" with a new name.
> Â To add another pwb, open it from the Rev E application and repeat the process.
> You can move any of the pwb's around, but I caution you to make sure it is "Grouped". Otherwise, you may leave parts of it behind.
> Â Also, you should remove any text that refers to the new panel as Rev E. Give it a different name, such as "Lin-03-02-2011".
> Scotty
>
> --- On Tue, 3/1/11, Lincheng Xiu <inlinebeginner@...> wrote:
>
> From: Lincheng Xiu <inlinebeginner@...>
> Subject: [spectrumanalyzer] How to merge PCB
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, March 1, 2011, 10:22 PM
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> Scotty
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> From: william sprowls <wsprowls@...>
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> Sent: Tue, November 30, 2010 7:54:27 PM
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> Hi Lin,
> Â Be sure to factor in the insertion loss of each filter. Perhaps the 7.5 KHz filter has more loss. A better reference to each other will be accurate once you have calibrated.
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> --- On Tue, 11/30/10, inlinebeginner <inlinebeginner@...> wrote:
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> What I could not explain is that the 7.5kHz filter get lower noise floor. It should be higher than 1kHz RB.
> Maybe the 1kHz filter frequency respond is not good enough?

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>
> Lin
>
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7749. Re: 11.155MHz crystals available in the UK

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-02 15:28:53 UTC
From: Sam
Topic: 7742 Message: 7749

Good point. I went through about 50 crystals to get two sets of 5. But help may be on the way. One purpose of the 4-crystal buffered filter that was included on Jim's recent board is to simplify the matching requirement. I probably won't be able to try this out for a while, but I hope someone will.

The board has two pairs of crystals joined through a buffer amplifier. Each pair should be easy to tune because each crystal will be responsible for a peak in the response and you just need to merge the peaks together. The Rm of the crystals is almost irrelevant (but stick with <=20 ohms if you can) as the amplifier can offset the loss, which is likely to be small anyway.

Frequency matching is also not critical, as long as you know the relative frequencies and their very approximate Cm values. Say you have four crystals that deviate from the target by 0, -100, -200 and -300 Hz. (You actually select the highest frequency as the target, so you will always have deviations of zero or negative values.) You make the first pair out of the 0 and -100 crystals. The 0 does not need a series capacitor; the -100 needs one to raise its frequency. The other pair consists of the -200 and -300, both with series capacitors to raise their frequencies to match the 0 crystal. (Actually, it doesn't matter which is paired with which, as long as you keep track.)

To get an idea of what series capacitance you need, you can use the fact that if the crystal frequency is P percent too low, where P is relatively small (it will be less than 0.1%), the internal Cm of the crystal needs to be decreased by 2P percent. This requires a series capacitor that is Cm/(2p), where p is P expressed as a ratio (p=P/100). If you don't know Cm, use Cm=0.018 pF as a starter.

The pairs can be tuned individually, since they have no resonant interaction. Just put a jumper across the pair you are not tuning. (And across its impedance matching components to the input or output.)

There are also coupling capacitors that can be adjusted, but based on simulations, the default values are likely to work well.

As I said, I have not yet tried this, but I don't see why it would not work with crystals that are off by 1000 Hz or even more.

On the other hand, if your crystals are close in frequency (maybe max deviation of 50 Hz?), this filter may work with no series capacitors at all--i.e., no tuning.

This 4-crystal filter is intended for very narrow bandwidths, and you don't have much choice of bandwidth. Based on simulations, it is likely to be in the 300-800 Hz range. And four crystals are plenty to get good ultimate attenuation in a narrow filter.

I did the above-mentioned simulations with data from a set of my crystals and a set of Scotty's. My Lm and Cm values differed by a factor of two from Scotty's, but the default circuit worked well with both.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "undercoupled" <undercoupled@...> wrote:
>
> Hi Chris,
>
> It takes a LOT of crystals to be able to match them closely. Scotty went through about 1000 crystals, and I went through about 2000, from a really good buy on Ebay . These are 10.111 MHz crystals. I still have several thousand left, unsorted, if anyone else wishes to tackle the job. The bigger the tested batch, the higher percentage yield of good matches. You might not get that many close sets from 80 crystals.
>
> Jerry Barnett
>
> --- In spectrumanalyzer@yahoogroups.com, "g3wie" <g3wie@> wrote:
> >
> > Hi All,
> >
> > Recently I purchased about 80 pieces of 11.155MHz crystals via the UK fleabay. I got them for a song as no-one else was bidding, with the thought they may well be selectable for use in the ladder filters of recent fame on this list and as featured in a group buy pcb.
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> > I'd like to make them available at zero cost apart from postage, in the same spirit as the previous huge batch which Scotty and Sam so valiantly tested (and of which I have some sets for my ssa). However they will require matching, and my ssa/vna is still in kit form. It's pretty much next on the project list and matching up a sets of crystals would be a good first use for it, as well as training for the operator. However, that will take some while to happen (realistically Christmas 2011). If anyone else would like to take up the challenge on a faster timescale, I'll happily ship the crystals along
> >
> > 73
> >
> > Chris g3wie
> >
>

7750. LPF on TG

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-02 18:44:00 UTC
From: Sam
Topic: 7750 Message: 7750

In the process of installing the new Mixer 3 amps, I have been playing with the TG output, which at the moment comes directly from mixer 3 with no buffer amp. I checked the output level at 100 MHz (running it to an HP analyzer), then inserted a 700 MHz low pass filter and checked again. The output level dropped 1.3 dB. So the filter must have 1.3 dB insertion loss, right?

Wrong. The actual insertion loss is 0.2 dB. The remaining loss comes from the filter reflecting LO2 and LO3 components back into the mixer. (Or, you could look at it as the filter shorting those components to ground). Due to phasing, the reflected components reduce the mixer output of 100 MHz by 1.1 dB; with a different reflection phase they might increase the output, and the effect might even be more than 1.1 dB.

Suppose you had two DUTs, one a 700 MHz low pass filter and one a 700 MHz high pass filter, both with insertion loss of 0.2 dB at 100 MHz. If you attach the low pass filter you get 0.2 dB of true insertion loss plus the bogus 1.1 dB decrease in output. If instead you attach the high pass filter, you get the correct 0.2 insertion loss, because the high frequency components are largely unaffected.

The point is that the measurement of a DUT at low frequency will be affected by its performance at high frequency, which is very undesirable. A side-benefit of the TG amp is that it isolates the output and prevents these reflections from having any significant effect. But an alternative is simply to leave a low-pass filter in place for all measurements, which is workable as long as you are not concerned with frequencies above the passband. The low pass filter has the advantage of also reducing any stray 1013.3 signal and also reducing 3G components that might be interpreted as 1G. Finally, the filter reduces the LO3 component, which causes a 10.7 MHz spur.

I use a MiniCircuits LFCN-575D low pass filter, which really kicks in at around 700 MHz. It is similar to a large SMT ceramic capacitor, but has its ground terminal on the bottom, extending up the sides. You build the board with connectors sticking out the ends like an attenuator. Multiple copies of the tiny board have been included in several of the recent PCB buys. (I think it is marked "LFCN".) I frequently use one on the TG and one on the MSA input. I suspect that some people who bought those boards have extras, so if anyone is interested in one you could post an inquiry here.

Sam W.

7751. Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-02 19:30:31 UTC
From: undercoupled
Topic: 7751 Message: 7751

Has anyone tried using a scroll saw with a fine pitch blade to separate the boards on a composite board panel? I don't have access to one to try. Probably prudent to try some scrap pcb first.
I have a large shear, but using it to shear small boards is like trying to kill a mosquito with a sledge hammer.
Jerry B

7752. Re: [spectrumanalyzer] Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-02 19:34:51 UTC
From: wb6kwt
Topic: 7751 Message: 7752

Yes, I tried it, two problems the blade has too much flex and it wore
out before I got one board free.

Bob
wb6kwt

On 3/2/2011 11:30 AM, undercoupled wrote:
> Has anyone tried using a scroll saw with a fine pitch blade to separate the boards on a composite board panel? I don't have access to one to try. Probably prudent to try some scrap pcb first.
> I have a large shear, but using it to shear small boards is like trying to kill a mosquito with a sledge hammer.
> Jerry B
>
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> Yahoo! Groups Links
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7753. Re: [spectrumanalyzer] Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-02 20:23:13 UTC
From: Jim Hontoria
Topic: 7751 Message: 7753

I always use a proxxon scroll saw with 36 tpi and other than poor blade life it works nicely

Jim G. Hontoria

Sent from my iPhone

On Mar 2, 2011, at 2:34 PM, wb6kwt <wb6kwt@...> wrote:

> Yes, I tried it, two problems the blade has too much flex and it wore
> out before I got one board free.
>
> Bob
> wb6kwt
>
> On 3/2/2011 11:30 AM, undercoupled wrote:
> > Has anyone tried using a scroll saw with a fine pitch blade to separate the boards on a composite board panel? I don't have access to one to try. Probably prudent to try some scrap pcb first.
> > I have a large shear, but using it to shear small boards is like trying to kill a mosquito with a sledge hammer.
> > Jerry B
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> > Yahoo! Groups Links
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7754. Re: Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-02 20:48:24 UTC
From: ke7axc
Topic: 7751 Message: 7754

I haven't used them, but there are some carbide coated scroll saw blades available. Not inexpensive though at about $6.00 US each. Breakage before they get dull would be a concern for me at that price since I seem to break them through poor technique. It might cost less overall to use the cheaper blades.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> I always use a proxxon scroll saw with 36 tpi and other than poor blade life it works nicely
>
> Jim G. Hontoria
>
> Sent from my iPhone
>
> On Mar 2, 2011, at 2:34 PM, wb6kwt <wb6kwt@...> wrote:
>
> > Yes, I tried it, two problems the blade has too much flex and it wore
> > out before I got one board free.
> >
> > Bob
> > wb6kwt
> >
> > On 3/2/2011 11:30 AM, undercoupled wrote:
> > > Has anyone tried using a scroll saw with a fine pitch blade to separate the boards on a composite board panel? I don't have access to one to try. Probably prudent to try some scrap pcb first.
> > > I have a large shear, but using it to shear small boards is like trying to kill a mosquito with a sledge hammer.
> > > Jerry B
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7755. Re: 11.155MHz crystals available in the UK

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-02 23:12:05 UTC
From: g3wie
Topic: 7742 Message: 7755

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Nice offer. I can't take any credit for the previous testing of the 10.11 MHz crystals. That was Scotty and Jerry Barnett. Jerry actually provided the crystals.
> Sam W.

Apologies to Jerry, proves I really shouldn't trust my memory any more...

I fully take the point about matching requiring a statistically large set to sample from; it will be interesting to see how this...

> One purpose of the 4-crystal buffered filter that was included on
> Jim's recent board is to simplify the matching requirement. I
> probably won't be able to try this out for a while, but I hope
> someone will.

... pans out. The offer is there for anyone who'd like some of the crystals

Chris g3wie

7756. Re: [spectrumanalyzer] Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-02 23:44:27 UTC
From: Robert Fish
Topic: 7751 Message: 7756

Hi Guys,

I've cut alot of boards up in the last few months. I started by using a hack saw blade, but before long, I realized that it took way too long and it was way too hard to be accurate. The cut would wander one way or the other and It didn't take long before you were dangerously close to the copper. I tried a jig saw, a scroll saw and a dremel tool with a cutting wheel attached. The scroll saw was probably the best of this bunch, but still not great results. The way I ended up cutting 99% of the boards I prepared for shipment
was as follows:

I placed a the panel of boards on my work bench. I then clamped a metal straight edge along the intended cut line and C-clamped the straight edge in place on top of the boards and to the bench. I then scored the boards along the straight edge 6 or 7 times with a very sharp (brand new blade) utility knife. I then turn the panel over and do the same thing on the other side of the board on the same cut line. A word of caution here, make sure you use a THICK straight edge, (I used the ruler part out of my combination square) at least 1/16th inch thick. You don't want that knife blade to jump up over the straight edge and take off a couple of fingertips. Another tip, center the knife blade between the copper traces of adjacent boards first, then slide the straight edge against the knife blade, then clamp it. If you center the straight edge first, your cut will not be centered. It will be offset by the thickness of the cut (it will be slightly wider than the blade because of the fibrous nature of the material). Trust me, it makes a difference on some of the cuts that have adjacent boards very close together. After the board is scored 6 or 7 times top and bottom along the cut line. I placed it in my Super Duper Harbor Freight bending brake, clamped it along the cut line, lifted the handles and it snaps the board right along the cut line. A couple of passes with some coarse sand paper (for flatness, place the sand paper on the bench top and draw the board across it) and your good to go.

If you don't have a bending brake, you could probably get away with clamping the board to the bench top under a piece of plywood or something and lifting with your thumbs. I didn't try this, but I suspect it would be OK. A bending Brake is perfect because it focuses all the force on the cut line.

Here is the exact brake I bought, I originally bought it to make electronic enclosures out of sheet aluminum, but I haven't made any yet. I've sure cut up alot of boards with it though.

http://www.harborfreight.com/30-inch-bending-brake-67240.html

The best part of this method is very little dust. All the saws and the dremel tool method produced dust clouds. Breathing fiberglass dust is not good for you. I kept a shop vac with a HEPA filter handy for clean up because of the large number of boards I cut.
Fiberglass dulls knife blades very quickly. It may take you several to do one set of boards.

Sorry for the long post but I thought some one might find it helpful. Of course, use this method at your own risk. That utility knife can do alot of damage if your not extremely carefull!

Bob

> Has anyone tried using a scroll saw with a fine pitch blade to
> separate the boards on a composite board panel? I don't have access to
> one to try. Probably prudent to try some scrap pcb first.
>
> I have a large shear, but using it to shear small boards is like
> trying to kill a mosquito with a sledge hammer.
> Jerry B
>
>

7757. LO2 Isolation Amp installed

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-02 23:45:20 UTC
From: Sam
Topic: 7757 Message: 7757

I have installed the LO2 isolation amp in the line from PLO2 to Mixer 3 to prevent leakage of LO3 into PLO2. The results are impressive and are shown in my album:

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/252922278/pic/list

There are two photos of the Zero-Response, one with and one without the buffer amp. At 100 kHz the level dropped from -75 dBm down to -95 dBm, and by 500 kHz it is into the -120 dBm noise floor. This greatly expands the dynamic range of the MSA at low frequencies, especially below 1 MHz. This is especially nice for the Component Meter function, which prefers to measure large capacitors at 100 kHz. I haven't tested it, but this expanded range conceivably could increase the maximum measurable capacitance by a factor of 10.

The zero response is in the noise by 500 kHz, but it is still there. There is a trick that can be used to detect it, as I showed in a document I posted somewhere, but can't remember where. If you do a zero-width Transmission mode scan at 1 MHz, with a 50-ohm termination on the TG and the MSA input connected to a 1 MHz signal source, you would expect to get a straight line graph. However, the phase of the signal source will drift with respect to that of the zero response, and the result will be a sine wave, if the zero response is strong enough to show itself.

At 1 MHz, with a -100 dBm input signal, I got a sine wave with amplitude about 1 dB, meaning the zero response was causing +/- 0.5 dB of error. Based on the table in my "Effects of Interference" paper, this suggests the zero response was about 26 dB below the input signal, or -126 dBm.

At 2 MHz, the zero response was just barely detectable as a wavy line with input of -105 dBm, suggesting it was below -140 dBm. This is important because 2 MHz is a nice frequency to use for path calibration. I previously suggested shifting to 5 MHz for low level calibration, but that is not necessary with the LO2 isolation amp.

Sam W.

7758. TG Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-03 00:48:28 UTC
From: Sam
Topic: 7758 Message: 7758

First of all, my last post stated that the LO2 Isolation Amp is impressive. I'm not tooting my own horn here; it was Scotty's idea. Great idea.

Second, the LO2 amp is built on the IF2 amp board which has room for a second amp. That's where I put the amp for the tracking generator. If you're going to do the LO2 amp, there is really no reason not to do the TG amp as well.

Benefits of the TG amp:

1. Higher output level, if you choose. For VNA modes, the MSA can accurately take inputs somewhere in the -5 dBm to 0 dBm range. When you feed a bridge in Reflection mode, the max output of the bridge may be anywhere from 6 to 20 dB below the input signal, so even a 0 dBm TG output could be useful.

2. Excellent output return loss for at least a few hundred MHz. This greatly simplifies many measurements. OK, so you could accuse me of being a member of the return loss police. Guilty.

3. Suppression of reflections of very high frequency signals back into Mixer 2. Discussed in recent postings.

Sam W.

7759. Oops! broken log detector balun!

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-03 05:26:21 UTC
From: William Dillon
Topic: 7759 Message: 7759

Hi Everyone,

I'm bummed that I accidentally broke the balun on the log detector.
I'm wondering if anyone has a spare that I could buy.

Thanks!!
- Will

7761. Re: Oops! broken log detector balun!

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-03 06:11:20 UTC
From: Ron
Topic: 7759 Message: 7761

Hmm! I'm glad I'm not the only one that's done that. In my case I didn't damage the core so I rewound it. Six turns and 24 turns if I remember OK. Easy enough to do.

Ron, VK7ZRO

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> Hi Everyone,
>
> I'm bummed that I accidentally broke the balun on the log detector.
> I'm wondering if anyone has a spare that I could buy.
>
> Thanks!!
> - Will
>

7762. Re: [spectrumanalyzer] Re: Oops! broken log detector balun!

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-03 10:44:09 UTC
From: Jurgen
Topic: 7759 Message: 7762

Order some samples from Coilcraft. They deliver withing days.

Jurgen

On 3/3/2011 1:07 AM, Ron wrote:
>
>
> Hmmm! I glad I'm not the only one that's done that. I my case I did
> not damage the core so I rewound it. Six turns and 24 turns if I
> remember OK. Easy enough to do.
>
> Ron, VK7ZRO.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, William Dillon
> <hpux735@...> wrote:
> >
> > Hi Everyone,
> >
> > I'm bummed that I accidentally broke the balun on the log detector.
> > I'm wondering if anyone has a spare that I could buy.
> >
> > Thanks!!
> > - Will
> >
>
>

7763. Re: Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-03 16:44:41 UTC
From: Clive Jenner
Topic: 7751 Message: 7763

I have cut 2 set's of boards and used a Proxxon circular saw and it is trouble free and accurate!

It's worth the cost for the accuracy alone.

73 Clive GW0PPO

7764. Re: [spectrumanalyzer] Re: Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-03 16:55:48 UTC
From: wb6kwt
Topic: 7751 Message: 7764

Clive,

What blade are you using?

Bob

On 3/3/2011 8:44 AM, Clive Jenner wrote:
> Proxxon circular saw

7765. Re: [spectrumanalyzer] Re: Oops! broken log detector balun!

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-03 19:58:53 UTC
From: William Dillon
Topic: 7759 Message: 7765

Thanks!

I wasn't excited about spending a minimum of $50 at minicircuits for a $10 part.

I'm looking at the coilcraft part: WBC16-1TL_

on the table here: http://www.coilcraft.com/wbc.cfm#table

Is that an equivalent part? It seems like it:

It's 1:16 impedance ratio, surface mount, and .6-300 Mhz bandwidth.
Also, the minicircuits is .17" by .17" where the coilcraft is .15" sq.

- Will

On Mar 3, 2011, at 2:44 AM, Jurgen wrote:

> Order some samples from Coilcraft. They deliver withing days.
>
> Jurgen
>
>
> On 3/3/2011 1:07 AM, Ron wrote:
>
>>
>>
>> Hmmm! I glad I'm not the only one that's done that. I my case I did not damage the core
so I rewound it. Six turns and 24 turns if I remember OK. Easy enough to do.
>>
>> Ron, VK7ZRO.
>>
>> --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>> >
>> > Hi Everyone,
>> >
>> > I'm bummed that I accidentally broke the balun on the log detector.
>> > I'm wondering if anyone has a spare that I could buy.
>> >
>> > Thanks!!
>> > - Will
>> >
>>
>
>

7766. Re: [spectrumanalyzer] Re: Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-03 20:09:17 UTC
From: Steve
Topic: 7751 Message: 7766

Clive,

What is the model number of the saw?

Thanks.

Steve K8JQ

On 3/3/2011 11:44 AM, Clive Jenner wrote:
> I have cut 2 set's of boards and used a Proxxon circular saw and it is
> trouble free and accurate!
>
> It's worth the cost for the accuracy alone.
>
> 73 Clive GW0PPO
>
>
> ----------
>
> Yahoo! Groups Links
>
>
>
>

7767. Re: [spectrumanalyzer] Re: Oops! broken log detector balun!

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-03 20:17:54 UTC
From: Jurgen
Topic: 7759 Message: 7767

I used part number WBC16-1TLB in my log detector.

Jurgen

On 3/3/2011 2:58 PM, William Dillon wrote:
>
> Thanks!
>
>
> I wasn't excited about spending a minimum of $50 at minicircuits for a
> $10 part.
>
> I'm looking at the coilcraft part: *WBC16-1TL_
> <http://www.coilcraft.com/forms/sample_cart/index.cfm?action=request_sample&part_number=
WBC16-1TLB>*
>
> on the table here: http://www.coilcraft.com/wbc.cfm#table
>
> Is that an equivalent part? It seems like it:
>
> It's 1:16 impedance ratio, surface mount, and .6-300 Mhz bandwidth.
> Also, the minicircuits is .17" by .17" where the coilcraft is .15" sq.
>
>
> - Will
>
> On Mar 3, 2011, at 2:44 AM, Jurgen wrote:
>
>> Order some samples from Coilcraft. They deliver withing days.
>>
>> Jurgen
>>
>>
>> On 3/3/2011 1:07 AM, Ron wrote:
>>
>>>
>>> Hmmm! I glad I'm not the only one that's done that. I my case I did
>>> not damage the core so I rewound it. Six turns and 24 turns if I
>>> remember OK. Easy enough to do.
>>>
>>> Ron, VK7ZRO.
>>>
>>> --- In spectrumanalyzer@yahoogroups.com
>>> <mailto:spectrumanalyzer%40yahoogroups.com>, William Dillon
>>> <hpux735@...> wrote:

```
>>> >
>>> > Hi Everyone,
>>> >
>>> > I'm bummed that I accidentally broke the balun on the log detector.
>>> > I'm wondering if anyone has a spare that I could buy.
>>> >
>>> > Thanks!!
>>> > - Will
>>> >
>>>
>>
>
>
```

7768. Re: How to merge PCB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-03 21:01:12 UTC
From: inlinebeginner
Topic: 7157 Message: 7768

Scotty
When I reviewed my question (that I wrote at midnight) today, it is very confusing. Here was the reason I ask that question:
I tried to merge/update some collection boards, like cal source, leveler..., but I got some problems. Therefore, I looked at your Panel Rev E, I found you grouped the modules, and I could not know how to group my modules. Therefore I sent the email to ask you how to group the module. Later I found, it is under >> Edit >> Group.
Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Lin,
> I'm not sure of your question. The Rev E panel is one big panel. If you want to create a larger panel with other modules and include the Rev E panel, do this:
> Open the Express .pcb of the PWB you want to include. "Copy" the whole pwb. Open the Express .pcb of the Rev E from the same application. "Paste" the pwb anywhere near, but not on top of what is already there. While it is highlighted, do a "Group". Then move it where you really want it. "Save" with a new name.
> Â To add another pwb, open it from the Rev E application and repeat the process.
> You can move any of the pwb's around, but I caution you to make sure it is "Grouped". Otherwise, you may leave parts of it behind.
> Â Also, you should remove any text that refers to the new panel as Rev E. Give it a different name, such as "Lin-03-02-2011".
> Scotty
>
> --- On Tue, 3/1/11, Lincheng Xiu <inlinebeginner@...> wrote:
>
> From: Lincheng Xiu <inlinebeginner@...>
> Subject: [spectrumanalyzer] How to merge PCB
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, March 1, 2011, 10:22 PM
>
>
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>
> Scotty
> Â How do you merge the Panel Rev E to one big PCB?
> Â I saw most of the module is grouped to one part, how did you do that?
> Thanks
> Lin
>
>
>
>
>
> From: william sprowls <wsprowls@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Tue, November 30, 2010 7:54:27 PM
> Subject: Re: [spectrumanalyzer] Re: MSA Noise floor
>
> Â
>
>
>
>
>
> Hi Lin,
> Â Be sure to factor in the insertion loss of each filter. Perhaps the 7.5 KHz filter has more loss. A better reference to each other will be accurate once you have calibrated.
> Scotty
>
> --- On Tue, 11/30/10, inlinebeginner <inlinebeginner@...> wrote:
>
>
> From: inlinebeginner <inlinebeginner@...>
> Subject: [spectrumanalyzer] Re: MSA Noise floor
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, November 30, 2010, 8:10 PM
>
>
> Â
>
> After I put fence and lid on log detector, I got:
> -98dBm 1kHz RB
> -100.5dBm 7.5kHz RB
> -96.8dBm 61kHz RB
> -93.7dBm 1kHz RB
> What I could not explain is that the 7.5kHz filter get lower noise floor. It should be higher than 1kHz RB.
> Maybe the 1kHz filter frequency respond is not good enough?
>

> Lin
>

7769. Re: Oops! broken log detector balun!

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-03 21:08:32 UTC
From: inlinebeginner
Topic: 7759 Message: 7769

Coilcraft's shipping is $6, with Ground, about two days.
I just ordered some baluns from coilCraft for the expended log detector.
Lin

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> Thanks!
>
> I wasn't excited about spending a minimum of $50 at minicircuits for a $10 part.
>
> I'm looking at the coilcraft part: WBC16-1TL_
>
> on the table here: http://www.coilcraft.com/wbc.cfm#table
>
> Is that an equivalent part? It seems like it:
>
> It's 1:16 impedance ratio, surface mount, and .6-300 Mhz bandwidth.
> Also, the minicircuits is .17" by .17" where the coilcraft is .15" sq.
>
>
> - Will
>
> On Mar 3, 2011, at 2:44 AM, Jurgen wrote:
>
> > Order some samples from Coilcraft. They deliver withing days.
> >
> > Jurgen
> >
> >
> > On 3/3/2011 1:07 AM, Ron wrote:
> >
> >>
> >>
> >> Hmmm! I glad I'm not the only one that's done that. I my case I did not damage the
core so I rewound it. Six turns and 24 turns if I remember OK. Easy enough to do.
> >>
> >> Ron, VK7ZRO.
> >>
> >> --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@> wrote:
> >> >
> >> > Hi Everyone,
> >> >
> >> > I'm bummed that I accidentally broke the balun on the log detector.
> >> > I'm wondering if anyone has a spare that I could buy.
> >> >

> >> > Thanks!!
> >> > - Will
> >> >
> >>
> >
> >
>

7770. SMA connector problem

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-03 23:59:04 UTC
From: Sam
Topic: 7770 Message: 7770

I had a problem with an SMA connector that I thought I'd mention in case someone else runs across it. My TG gets to the outside world through a panel-mount female-female connector. A cable attaches to the inside, coming from the TG amp. While I was messing with the TG amp, the TG output came and went. Sometimes it was strong; sometimes is was very weak at low frequency and modest at high frequency.

It turned out that when I screwed the inside cable to the panel connector a good connection was made until I made it very tight (hand-tight; I wasn't over-tightening). At a certain tightness, the cable center pin apparently was suddenly not making contact with its mate in the female-female connector, or maybe the problem was internal to that connector. All the parts I could see looked fine. I still can't imagine how this was happening, but I replaced the connector and all is fine.

The connector was one of the inexpensive Chinese types.

Sam W.

7771. Cal Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-04 14:37:38 UTC
From: Sam
Topic: 7771 Message: 7771

The "1MHz Cal Source" provides an output whose precise level can be determined with an ordinary voltmeter. It was originally intended to operate at 1 MHz (from an an-board oscillator or external source). But, due to the zero-response interfering with low level signals at 1 MHz, it is actually better to use 2 MHz. The circuit divides the input frequency in half to get a 50% duty cycle, so getting 2 MHz output actually requires a 4 MHz oscillator or input. I'm going to rename this board the "xMHz Cal Source". It should be precise with 1-5 MHz output, though it will be functional far beyond that. Just remember to use an oscillator at twice the frequency of the desired output.

You can use this directly as the signal source for path calibration, adding attenuation as necessary. Unfortunately, this won't work for phase calibration since you can't synchronize the cal source with the MSA phase. (You can use the TG to feed the cal source, but its frequency will get divided by two.)

If you have an external signal source, you can use this to calibrate its output level at 2 MHz. Just measure the cal source on a very coarsely calibrated MSA and then measure the signal source and adjust its output until it equals that of the cal source. The true output of the signal source then equals the true output of the cal source (determined by the voltmeter measurement--forget what the MSA is displaying.) Then use the signal source for mag calibration. Not phase calibration, unless you can phase lock the signal source to the TG.

Or, you can use the cal source to calibrate the output level of the TG, and use that for both mag and phase calibration. In this case, you will have to attenuate the cal source output to get it down to the TG level, or amplify the TG to get it up to the cal source level (about 0 dBm).

You can also do the comparison of signal levels with a scope or power meter instead of using the MSA.

Sam W.

7772. Re: Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-04 16:28:55 UTC
From: Clive Jenner
Topic: 7751 Message: 7772

Hi I am using the Proxxon KS-230 bench saw . This sells for around 100$ US. I am using a Saw blade, with the following markings 58x 0.5 x10 Z=80 Max 8000 per minute Mat HL. After cutting two sets of boards the blade is still very sharp. Mind your fingers! Proxxon do a range of blades for different work.

The unit is very small and packs away nicely. Ideal for all those model engineering and Ham radio jobs.

No I have no connection with Proxxon just a satisfied customer!

73 Clive GW0PPO

7773. Re: Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-04 17:04:57 UTC
From: Clive
Topic: 7751 Message: 7773

Ooops, make that £100 UK. Sorry and 73 Clive GW0PPO

73 Clive GW0PPO

--- In spectrumanalyzer@yahoogroups.com, Clive Jenner <clivejenner@...> wrote:
>
> Hi I am using the Proxxon KS-230 bench saw . This sells for around 100$
> US. I am using a Saw blade, with the following markings 58x 0.5 x10
> Z=80 Max 8000 per minute Mat HL. After cutting two sets of boards the
> blade is still very sharp. Mind your fingers! Proxxon do a range of
> blades for different work.
>
> The unit is very small and packs away nicely. Ideal for all those model
> engineering and Ham radio jobs.
>
> No I have no connection with Proxxon just a satisfied customer!
>
> 73 Clive GW0PPO
>

7774. Frequency Multiplier

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-05 02:48:18 UTC
From: william
Topic: 1100 Message: 7774

Hi All,
Since the latest group buy of board contained a PWB for the SRD Multiplier, I decided to update the page:

http://scottyspectrumanalyzer.com/srd/srd.html

There are a few more things I want to do with it. The schematic and layout need updating to conform to SLIM requirements. But, for now, I thought the descriptions needed clarification.
You will notice that I stated on that page that replacing the MSA's PLO 2 with a multiplier is not justified unless PLO 1 is modified to decrease its phase noise. There have been a couple of builders who have expressed interest in using a YIG synthesizer for PLO 1. This is where the multiplier would be highly beneficial for PLO 2.
As was stated, the multiplier is experimental. It really is a lot of fun to dicker with (full of voodoo, too).
Scotty

7775. Amplifilter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-05 17:17:33 UTC
From: Sam
Topic: 7775 Message: 7775

I decided to move the amplifilter to the top of the list, and built it with four crystals having a total frequency spread of 66 Hz and not particularly good Rm values. I did not include any of the trimmer caps and did no tuning whatsoever. The results are shown here:

<http://groups.yahoo.com/group/spectrumanalyzer/photos/album/271352628/pic/639082963/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>

The graphs are uncalibrated, so everything shows 11.7 dBm below actual value. The filter has BW=700 Hz and insertion loss of 4 dB. Ultimate attenuation is beyond 100 dB. It has no ripple whatsoever, and the peak is just slightly asymmetric. Some tuning could reduce the bandwidth and the op amp gain could be adjusted to eliminate the loss, but this is quite nice the way it is.

The schematic shows 1 nF series capacitors on the crystals but those should be 10 nF, which I used--these are the capacitors you would tinker with to adjust crystal frequencies. Before adding the crystals, I jumpered across the crystal pads (from the input of each pair to its output) and checked the response with just the impedance matching components and the op amp, which peaked a little below 10.7 MHz, so I need to adjust the impedance matching--I'll just lower the inductor value. The impedance matching components actually do very little impedance matching; they are there mainly as lowpass filters.

Note also that I used no fencing whatsoever, and the crystal leads are exposed a bit on the bottom of the board, to make it easier to remove the crystals to experiment. Yet there is no apparent blowby problem.

Sam W.

7776. Re: Amplifilter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-05 20:39:59 UTC
From: Sam
Topic: 7775 Message: 7776

I changed the impedance matching inductors without much effect. Changed the 10 nF cap on the lowest frequency crystal to 1 nF and now have a very symmettric response.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I decided to move the amplifilter to the top of the list, and built it with four crystals having a total frequency spread of 66 Hz and not particularly good Rm values. I did not include any of the trimmer caps and did no tuning whatsoever. The results are shown here:
>
> <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/271352628/pic/639082963/view?picmode=&mode=tn&order=ordinal&start=1&;count=20&dir=asc>
>
> The graphs are uncalibrated, so everything shows 11.7 dBm below actual value. The filter has BW=700 Hz and insertion loss of 4 dB. Ultimate attenuation is beyond 100 dB. It has no ripple whatsoever, and the peak is just slightly asymmetric. Some tuning could reduce the bandwidth and the op amp gain could be adjusted to eliminate the loss, but this is quite nice the way it is.
>
> The schematic shows 1 nF series capacitors on the crystals but those should be 10 nF, which I used--these are the capacitors you would tinker with to adjust crystal frequencies. Before adding the crystals, I jumpered across the crystal pads (from the input of each pair to its output) and checked the response with just the impedance matching components and the op amp, which peaked a little below 10.7 MHz, so I need to adjust the impedance matching--I'll just lower the inductor value. The impedance matching components actually do very little impedance matching; they are there mainly as lowpass filters.
>
> Note also that I used no fencing whatsoever, and the crystal leads are exposed a bit on the bottom of the board, to make it easier to remove the crystals to experiment. Yet there is no apparent blowby problem.
>
> Sam W.
>

7777. Re: [spectrumanalyzer] Amplifilter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-05 21:22:00 UTC
From: Jim Hontoria
Topic: 7775 Message: 7777

Sam,

The trimmer cap values that you show in the amplifilter schematic, are they
the "target" value or are they the max value of the cap?
Obviously, in the first case the max value will have to be somewhat larger.

Jim W1JGH

On Sat, Mar 5, 2011 at 12:17 PM, Sam <swetterlin@...> wrote:

>
>
> I decided to move the amplifilter to the top of the list, and built it with
> four crystals having a total frequency spread of 66 Hz and not particularly
> good Rm values. I did not include any of the trimmer caps and did no tuning
> whatsoever. The results are shown here:
>
> <
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/271352628/pic/639082963/view
?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc<http://groups.yahoo.com/group
/spectrumanalyzer/photos/album/271352628/pic/639082963/view?picmode=&mode=tn&order=ordinal
&start=1&count=20&dir=asc>
> >
>
> The graphs are uncalibrated, so everything shows 11.7 dBm below actual
> value. The filter has BW=700 Hz and insertion loss of 4 dB. Ultimate
> attenuation is beyond 100 dB. It has no ripple whatsoever, and the peak is
> just slightly asymmetric. Some tuning could reduce the bandwidth and the op
> amp gain could be adjusted to eliminate the loss, but this is quite nice the
> way it is.
>
> The schematic shows 1 nF series capacitors on the crystals but those should
> be 10 nF, which I used--these are the capacitors you would tinker with to
> adjust crystal frequencies. Before adding the crystals, I jumpered across
> the crystal pads (from the input of each pair to its output) and checked the
> response with just the impedance matching components and the op amp, which
> peaked a little below 10.7 MHz, so I need to adjust the impedance
> matching--I'll just lower the inductor value. The impedance matching
> components actually do very little impedance matching; they are there mainly
> as lowpass filters.
>
> Note also that I used no fencing whatsoever, and the crystal leads are
> exposed a bit on the bottom of the board, to make it easier to remove the
> crystals to experiment. Yet there is no apparent blowby problem.
>
> Sam W.

>
>
>

--
Jim G. Hontoria

7778. Re: Amplifilter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-05 22:19:50 UTC
From: Sam
Topic: 7775 Message: 7778

Jim,
They are target values. However, I left them out completely.

I have now made just a few adjustments to the original and have achieved a 525 Hz bandwidth with a very nice profile. See:

<http://groups.yahoo.com/group/spectrumanalyzer/photos/album/271352628/pic/2136370248/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>

I did end up "trimming" the 330 pF caps by putting 100 pF on top of them. This reduced the coupling and improved the peak shape. This may be unnecessary for those using the crystals from Scotty and Jerry. Because of the reduced coupling, the loss increased so I increased the op amp gain.

The response is absolutely free of filter spurs (only my tiny MSA 10.7 MHz spur) from 1 to 100 MHz, except I got a small glitch at 75 MHz that is due to leakage between the two pairs of filter cans and goes away if I hold a piece of metal to the ground plane between the pairs. (I still don't have the cans firmly against the ground plane.) Even without fencing, that was the only visible leakage glitch and everything is clean down to at least -105 dBc.

This thing performed very well out of the box, and these minor tweaks made it as close to perfect as I could want. I actually got the bandwidth down to 400 Hz by reducing the coupling a little more, but that introduced a 1.3 dB ripple near one 3 dB point. Not a big deal, but I decided 525 Hz was narrow enough for me and I went for the cleaner shape.

Sam W.

--- In spectrumanalyzer@...m, Jim Hontoria <jghalpha@...> wrote:
>
> Sam,
>
> The trimmer cap values that you show in the amplifilter schematic, are they
> the "target" value or are they the max value of the cap?
> Obviously, in the first case the max value will have to be somewhat larger.
>
> Jim W1JGH
>

7779. Re: [spectrumanalyzer] Re: Amplifilter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-05 23:47:55 UTC
From: Jim Hontoria
Topic: 7775 Message: 7779

Very impressive. Nice.

Jim

On Sat, Mar 5, 2011 at 5:19 PM, Sam <swetterlin@...> wrote:

>
>
> Jim,
> They are target values. However, I left them out completely.
>
> I have now made just a few adjustments to the original and have achieved a
> 525 Hz bandwidth with a very nice profile. See:
>
> <
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/271352628/pic/2136370248/vie
w?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc
> >
>
> I did end up "trimming" the 330 pF caps by putting 100 pF on top of them.
> This reduced the coupling and improved the peak shape. This may be
> unnecessary for those using the crystals from Scotty and Jerry. Because of
> the reduced coupling, the loss increased so I increased the op amp gain.
>
> The response is absolutely free of filter spurs (only my tiny MSA 10.7 MHz
> spur) from 1 to 100 MHz, except I got a small glitch at 75 MHz that is due
> to leakage between the two pairs of filter cans and goes away if I hold a
> piece of metal to the ground plane between the pairs. (I still don't have
> the cans firmly against the ground plane.) Even without fencing, that was
> the only visible leakage glitch and everything is clean down to at least
> -105 dBc.
>
> This thing performed very well out of the box, and these minor tweaks made
> it as close to perfect as I could want. I actually got the bandwidth down to
> 400 Hz by reducing the coupling a little more, but that introduced a 1.3 dB
> ripple near one 3 dB point. Not a big deal, but I decided 525 Hz was narrow
> enough for me and I went for the cleaner shape.
>
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...>
> wrote:
> >
> > Sam,
> >

> > The trimmer cap values that you show in the amplifilter schematic, are
> they
> > the "target" value or are they the max value of the cap?
> > Obviously, in the first case the max value will have to be somewhat
> larger.
> >
> > Jim W1JGH
> >
>
>
>

--
Jim G. Hontoria

7780. Re: [spectrumanalyzer] Re: Amplifilter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-06 00:58:42 UTC
From: Jim Hontoria
Topic: 7775 Message: 7780

Sam, It looks like the OPA695 works at 5 VDC instead of 8. Or do you think
is better to push it to 8? I can't find the 842.

Jim

On Sat, Mar 5, 2011 at 6:47 PM, Jim Hontoria <jghalpha@...> wrote:

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> On Sat, Mar 5, 2011 at 5:19 PM, Sam <swetterlin@comcast.net> wrote:
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>> ripple near one 3 dB point. Not a big deal, but I decided 525 Hz was narrow
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>> Sam W.

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>> --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...>
>> wrote:
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>> > Sam,
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>> > The trimmer cap values that you show in the amplifilter schematic, are
>> they
>> > the "target" value or are they the max value of the cap?
>> > Obviously, in the first case the max value will have to be somewhat
>> larger.
>> >
>> > Jim W1JGH
>> >
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> --
> Jim G. Hontoria
>

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Jim G. Hontoria

7781. Re: Amplifilter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-06 01:49:33 UTC
From: Sam
Topic: 7775 Message: 7781

Interesting. I just finished sending an email to Scotty on a related topic. The OPA695 is a fabulous op amp, but I don't think it has enough voltage swing for this purpose, when operated at 5V. When the MSA has max input, the op amp has to be able to handle whatever voltage swing is created at the filters. I use the Expanded Log Amp, which uses less IF2 amplification, so this is less of an issue.

One limitation of op amps with large signals is that if you want a 50-ohm output, you have to insert a 49.9 ohm series resistor, and let the op amp swing twice the voltage of the load. That's the downside of the miracle of op amps having near-zero output impedance. So you sometimes run into voltage swing problems where you wouldn't expect it.

Worst case would be that the very narrow filter max out at a lower MSA input level than other filters. Maybe -5 dBm instead of 7 dBm. That's probably not a huge deal. The amplifilter allows an 8v LDO regulator, or a 78L05 or 78L06. I'm actually using +5V with an OPA356 (semi-rail-to-rail). Using +8V would expand the range, but the OPA356 can't take that voltage. So the schematic shows an OPA842. But that op amp is not rail-to-rail, so it may have no better range at +8v than the OPA356 does at +5v. And then there are slew rate limitations....

A couple of years ago, you could search data sheets for the right op amp and then go to Digi-Key or Mouser to buy it. Now, the range of available op amps is far more limited.

At the moment, I think the best options are the OPA356 at +5V or the OPA695 at +8V. When the OPA842 is available again, that is also a good choice at +8v. I'm using the OPA356 because it is cheaper, though I would say there is hardly an RF application imaginable where the OPA695 is not the op amp of choice.

Sam W.

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7782. Re: [spectrumanalyzer] Re: Amplifilter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-06 10:48:25 UTC
From: Jim Hontoria
Topic: 7775 Message: 7782

The datasheet "absolute maximum rating" for the OPA695 is +/- 6.5 Volts.

Jim

On Sat, Mar 5, 2011 at 8:49 PM, Sam <swetterlin@...> wrote:

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Jim G. Hontoria

7783. Re: Amplifilter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-06 13:43:57 UTC
From: Sam
Topic: 7775 Message: 7783

Yes, the OPA695 can do fine with a wide range of supply voltages. The question is whether its output has enough range with a 5v supply. The output can swing within 1.4v of the rails, which eliminates the top and bottom 1.4v, leaving 2.2v of voltage swing. If you have a series 50 ohm resistor leading to a 50 ohm load, that gives 1.1 Vp-p of swing at the load. That's about 5 dBm. That is plenty with the Expanded Log Detector using 28 dB of IF2 fixed gain, but maybe not when using the standard 40 dB IF2 amp.

It would be a simple matter to use a 6v supply rather than 5v, by just using a 78L06. That entire extra volt becomes available as output swing (half of it at the load). The PCB also allows for an LDO regulator that would provide 8v. Or, you could just accept that the top end of the MSA input would be lower with this filter (not that normal levels would suddenly cause harm; the response would just flatten). The MSA responds to signals above -5 dBm, but in SA mode they are highly distorted so their loss in this filter path might not be a big deal.

If the OPA695 is what you have, I suggest giving it a try. You can always change the supply regulator later if necessary. You will certainly get good performance over most of the signal range; it's just a question of where it tops out.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
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7784. Re: Amplifilter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-06 16:52:48 UTC
From: Sam
Topic: 7775 Message: 7784

The amplifilter provides a potential method to lower the noise floor, viewed from the MSA input. If you increase the amplification by 10 dB, you get a stronger signal without much more noise, due to the filtering by the pair of crystals that follows the amp. The op amp output will be inherently limited and will not damage the crystal pair that follow it. Rather the response for high end signals will simply flatten out. You could probably lower the noise floor by 8-10 dB by this method, using the current board. If the board were revised to include two op amps, you could achieve 30 dB. Of course, everything you gain at the low end you lose at the top end. But it might be handy to have one path that can detect extremely low level signals.

This idea is not unique to the amplifilter. You could add an amplifier to any of the four paths to shift its dynamic range to a lower low end and a lower high end.

P.S., Based on a conversation with Scotty, the OPA695 should come within a few dB of the ideal max output with a 6v supply. 8v would give it everything it needs. But if you want to go for max gain, I would use the OPA847 with 8v.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Yes, the OPA695 can do fine with a wide range of supply voltages. The question is whether its output has enough range with a 5v supply. The output can swing within 1.4v of the rails, which eliminates the top and bottom 1.4v, leaving 2.2v of voltage swing. If you have a series 50 ohm resistor leading to a 50 ohm load, that gives 1.1 Vp-p of swing at the load. That's about 5 dBm. That is plenty with the Expanded Log Detector using 28 dB of IF2 fixed gain, but maybe not when using the standard 40 dB IF2 amp.
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7785. Re: [spectrumanalyzer] Re: Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-06 17:59:25 UTC
From: Steve
Topic: 7751 Message: 7785

Thanks for the info Clive.

Anyone know of a US source for this saw? An internet search turned up numerous European dealers as well as some hits in Australia and New Zealand. But no US source.

Help.

Steve K8JQ

On 3/4/2011 11:28 AM, Clive Jenner wrote:
> Hi I am using the Proxxon KS-230 bench saw . This sells for around 100$
> US. I am using a Saw blade, with the following markings 58x 0.5 x10
> Z=80 Max 8000 per minute Mat HL. After cutting two sets of boards the
> blade is still very sharp. Mind your fingers! Proxxon do a range of
> blades for different work.
>
> The unit is very small and packs away nicely. Ideal for all those model
> engineering and Ham radio jobs.
>
> No I have no connection with Proxxon just a satisfied customer!
>
> 73 Clive GW0PPO
>
>
> ------------------------------------
>
> Yahoo! Groups Links
>
>
>
>

--
Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

7786. Re: [spectrumanalyzer] Re: Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-06 18:14:05 UTC
From: wb6kwt
Topic: 7751 Message: 7786

I couldn't find that model but here is something like it. Maybe Clive
can let us know if this looks familiar, could be just a model number change.

http://www.amazon.com/Proxxon-37006-115-Bench-Circular/dp/B0017TO806/ref=sr_1_1?ie=UTF8&s=hi&qid=1299435099&sr=8-1

Bob

On 3/6/2011 9:59 AM, Steve wrote:
> Proxxon KS-230

7787. Re: [spectrumanalyzer] Re: Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-06 18:22:51 UTC
From: Phil Sittner
Topic: 7751 Message: 7787

Steve-

Harbor Freight sells a small 4" table saw the may work well for this purpose.

Phil
----- Original Message -----
From: Steve
To: spectrumanalyzer@yahoogroups.com
Sent: Sunday, March 06, 2011 9:59 AM
Subject: Re: [spectrumanalyzer] Re: Cutting apart circuit board panels

Thanks for the info Clive.

Anyone know of a US source for this saw? An internet search turned up numerous European dealers as well as some hits in Australia and New Zealand. But no US source.

Help.

Steve K8JQ

On 3/4/2011 11:28 AM, Clive Jenner wrote:
> Hi I am using the Proxxon KS-230 bench saw . This sells for around 100$
> US. I am using a Saw blade, with the following markings 58x 0.5 x10
> Z=80 Max 8000 per minute Mat HL. After cutting two sets of boards the
> blade is still very sharp. Mind your fingers! Proxxon do a range of
> blades for different work.
>
> The unit is very small and packs away nicely. Ideal for all those model
> engineering and Ham radio jobs.
>
> No I have no connection with Proxxon just a satisfied customer!
>
> 73 Clive GW0PPO
>
>
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>
> Yahoo! Groups Links
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>

--
Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

7788. Re: Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-06 18:22:02 UTC
From: n6tdt
Topic: 7751 Message: 7788

I have used the Harbor Freight (aka cheap Chinese junk)4 inch Mighty-Mite saw with a diamond blade.

http://www.harborfreight.com/catalogsearch/result?category=&q=mighty+saw

http://www.harborfreight.com/4-inch-diamond-blade-95315.html

It works but one had better expect the thing to slow down due to an under powered motor.

The saw was around $35 and the diamond blade $5.00

If you don't mind working slow, this will do the job for you.

Dan Ellis
N6TDT

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
>
> Thanks for the info Clive.
>
> Anyone know of a US source for this saw? An internet search turned up
> numerous European dealers as well as some hits in Australia and New
> Zealand. But no US source.
>
> Help.
>
> Steve K8JQ
>
> On 3/4/2011 11:28 AM, Clive Jenner wrote:
> > Hi I am using the Proxxon KS-230 bench saw . This sells for around 100$
> > US. I am using a Saw blade, with the following markings 58x 0.5 x10
> > Z=80 Max 8000 per minute Mat HL. After cutting two sets of boards the
> > blade is still very sharp. Mind your fingers! Proxxon do a range of
> > blades for different work.
> >
> > The unit is very small and packs away nicely. Ideal for all those model
> > engineering and Ham radio jobs.
> >
> > No I have no connection with Proxxon just a satisfied customer!
> >
> > 73 Clive GW0PPO
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> Read The Patriot Post Vertitas vos Liberabit
> http://patriotpost.us/subscription/
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7789. Amplifilter schematics,

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-06 20:38:51 UTC
From: davidhooau
Topic: 7789 Message: 7789

Folks,

Could someone please point me in the direction of the amplifilter schematics?

Also, on Jim's filter panel (thanks Jim!!) are a pair of ceramic RBW filters which appear orphaned from the parent documentation.

Thanks,

davidh

7790. Re: LD coarse cal (test as you build)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-06 21:09:28 UTC
From: davidhooau
Topic: 7733 Message: 7790

Hi Scotty,

Many thanks for this. You were correct regarding the +11dBm data point; I had failed to remove that entry from an earlier test.

My LD is well saturated by about +12dBm at J1, which is consistent with figures 8 and 11 in the data-sheet. I'd appreciate feedback from other builders regarding this.

Cheerio,

davidh

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi David,
> Â After comparing your Log Detector data to the Verification MSA's Log Detector:
> 1. Your slope between linear points (+10 dBm to -80 dBm) averages 20.67 mv/dB. My slope is 20.55 mv/db. This is only a difference error of 0.6%. With these two data sets, one can use an average slope (among various Log Detectors) of 20.61 mv/dB. The slope of the Log Det is slightly affected by Vcc.
> 2. With the 16 bit AtoD, this is an average slope of 270.1 bits/dB.
> 3. Your data at 0 dBm is 1.1 dB different than the Verif MSA. However, you stated your 3325 is uncalibrated, and my source was calibrated. So, one can assume that 0 dBm into a Log Detector should produce an output voltage of 2.16 volts, with a bit count of 28326. Using that value as a calibration point, there will be some error from unit to unit because the voltage output of the Log Det is also slightly affected by Vcc.
> 4. Your data point at +11 dBm looks bogus. I'll bet my paycheck (well, I don't get one anyway) that your data point is really +15 dBm or higher.
>
> Bottom line to all this. If any builder would like a "pre-set" coarse calibration for the Log Detector and 16 Bit serial AtoD, do this:
> 1. If you don't have a path 2 filter, create one in the Hardware Configuration Manager using the same filter characteristics as the one in Path 1. If you do have a real filter to use in Path 2, you can use Path 3 or Path 4.
> 2. Open the Initial Cal Manager, and click the path 2 (or the path you want to use). This changes the table to Path Calibration Table.
> 3. Enter 3 sets of values:
> ADC = 0, dbm = -104.91, Phase = 0
> ADC = 28326, dbm = 0, Phase = 0
> ADC = 65534, dbm = 137.81, Phase = 0
> delete any other sets of values
> 4. Click Cleanup, then click Save File
> Â (Of course, the -104 and 137 dB points are not obtainable, but the values establish data points for the software to calculate "real" power inputs.)
> 5. From this point on, you can command the MSA to use Path 2 and the Magnitude will indicate the exact power on the input to the Log Detector, NOT the power input to the MSA. It should be fairly accurate (+/- .5dB) from +15 dB down to -80 dBm. Below -80, the Log Detector is operating in its non-linear area, but it will certainly indicate data. Due to some error from MSA to MSA ,your mileage may vary!

> Scotty
>
> --- On Sun, 2/27/11, davidhooau <dhooke@...> wrote:
>
> From: davidhooau <dhooke@...>
> Subject: [spectrumanalyzer] Re: LD coarse cal (test as you build)
> To: spectrumanalyzer@yahoogroups.com
> Date: Sunday, February 27, 2011, 12:53 PM
>
>
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>
> Howdy Scotty,
>
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>
> Below is the table generated using an un-cal'd 3325A as a signal source and 355D switched attenuator. My ADC reference is 4.9751V.
>
>
>
> I have to travel for the next week, but will repeat the tests on my return, as my LD appears to be outside the data-sheet specs (from 0 to -10dBm I see 211mV/10dB).
>
>
>
> Many thanks.
>
>
>
> davidh
>
>
>
> *Filter Path 1: CenterFreq=10.700000 MHz; Bandwidth=30.700000 KHz
>

> *Calibrated 02/20/11 at 10.700000 MHz.
>
> CalVersion= 1.03
>
> MagTable=
>
> * ADC dbm Phase in increasing order of ADC
>
> 4818 -110.000 0.00
>
> 4897 -100.000 0.00
>
> 5274 -90.000 0.00
>
> 7082 -80.000 0.00
>
> 9716 -70.000 0.00
>
> 12362 -60.000 0.00
>
> 15031 -50.000 0.00
>
> 17700 -40.000 0.00
>
> 20374 -30.000 0.00
>
> 23071 -20.000 0.00
>
> 25842 -10.000 0.00
>
> 28625 0.000 0.00
>
> 31386 10.000 0.00
>
> 32937 11.000 0.00
>
>
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
>
> >
>
> > Hi David,
>
> > Ã You bring up a good concern. What would be best is supply the MSA software with some pre-loaded values that conform to a completed log detector module. I would also like the same type of data for a completed MSA (front end input vs Magnitude bit count). We "sorta" have the latter in the Path 1 pre-loaded table. But it is too coarse. I will perform a calibration of the Log Detector and create a table and use it for a pre-load for Path 2. This will help builders who are testing as they build.

>
> > Ã☐ If you (or anyone) would like to, perform a Mag Cal on your Log Detector and send me the results to compare to what I get. Use 10.7 MHz +/- 1 MHz. Go from +15 dBm (or as high as you can) to -110 dBm in 5 dB or 10 dB steps (or finer steps if convenient to you). Your table will be LD input power (in dBm) vs. Magnitude bit count. Of course, the Magdata is available in the Variables Window.
>
> > Scotty
>
> >
>
> > --- On Sun, 2/27/11, davidhooau <dhooke@> wrote:
>
> >
>
> > From: davidhooau <dhooke@>
>
> > Subject: [spectrumanalyzer] LD coarse cal (test as you build)
>
> > To: spectrumanalyzer@yahoogroups.com
>
> > Date: Sunday, February 27, 2011, 3:07 AM
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> > Folks,
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>
> > There's part of the LD coarse cal which I either don't understand (or disagree with).
>
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>
> > Looking at the AD8306 data-sheet, in particular figures 8 and 11 on page 5, shows the 10MHz response falling away at about -90dBV (about -102dBm at the transformer input). This matches the tests I've done, where I'm seeing the gain start to flatten out at around -90dBm and pretty much fall off the cliff at -100dBm.
>
> >
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>
> > The TAYB procedure sets up a path 1 cal file using the "loaded" log detector noise floor and sets this ADC value to -116dBm. This is the almost same ADC value I'm seeing for -100dBm signals, and as a consequence, there's a considerable slope error between the -8dBm point from DDS1 J3 down to this basement level.
>
> >
>
> >
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> >
>
> > When I re-cal using an additional point below the level expected during the mixer tests, I have found most of the mysterious 2dB of mixer loss from previous tests has been rediscovered (sadly not all of it yet).
>
> >
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> >

>
> >
>
> > Have I missed something obvious? Or, is it worthwhile changing the TAYB to ask for an additional measurement using an attenuator, or should the current -116dBm value be changed to something around the -100dBm mark?
>
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>
> > Thanks,
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>
> > davidh
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> >
>

7791. Re: Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-06 21:34:27 UTC
From: mcmurraygrouch57
Topic: 7751 Message: 7791

sears sell yhe model ks-115 for 129, internet only some on ebay too.
ron

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
>
> Thanks for the info Clive.
>
> Anyone know of a US source for this saw? An internet search turned up
> numerous European dealers as well as some hits in Australia and New
> Zealand. But no US source.
>
> Help.
>
> Steve K8JQ
>
> On 3/4/2011 11:28 AM, Clive Jenner wrote:
> > Hi I am using the Proxxon KS-230 bench saw . This sells for around 100$
> > US. I am using a Saw blade, with the following markings 58x 0.5 x10
> > Z=80 Max 8000 per minute Mat HL. After cutting two sets of boards the
> > blade is still very sharp. Mind your fingers! Proxxon do a range of
> > blades for different work.
> >
> > The unit is very small and packs away nicely. Ideal for all those model
> > engineering and Ham radio jobs.
> >
> > No I have no connection with Proxxon just a satisfied customer!
> >
> > 73 Clive GW0PPO
> >
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> > Yahoo! Groups Links
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> --
> Read The Patriot Post Vertitas vos Liberabit
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7792. Re: Amplifilter schematics,

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-06 21:55:13 UTC
From: Sam
Topic: 7789 Message: 7792

I think Jim distributed it to those who bought the board, but it appears on Sheet 2 of the 4-crystal filter file. I just tweaked it a bit and added some build notes, and posted it in the Files section under Amplifilter.

I think Jim's board contained a dual ceramic filter and also several single ceramic filters. The dual filter is just two cascaded filters, no coupling capacitor and LC impedance matching on each side to whatever the manufacture specifies as the filter impedance. The single filter is the same concept; I don't know if there are actual schematics. Each can use the old leaded style filters or the newer SMT types.

The single ceramic board can also likely be used with the MiniCircuits LFCN lowpass filters that I mentioned in a recent posting, or with the similar HFCN highpass filters.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Folks,
>
> Could someone please point me in the direction of the amplifilter schematics?
>
> Also, on Jim's filter panel (thanks Jim!!) are a pair of ceramic RBW filters which appear orphaned from the parent documentation.
>
> Thanks,
>
> davidh
>

7793. Re: Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-07 16:32:18 UTC
From: Clive Jenner
Topic: 7751 Message: 7793

Sorry your having problems locating the Proxxon KS230. Try the link below for suggested outlets in the USA

http://proxxonusa.com/

and click on customer services.

I have emailed them as well asking for suggestions.

Stick with it I can assure you that the product is worth it.

Good Luck and 73 Clive GW0PPO

7794. Re: Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-07 16:37:50 UTC
From: Clive Jenner
Topic: 7751 Message: 7794

I have just twigged this the KS230 is probably the 230Volt version of
the KS115 as we say over here simples!
Go get it.

73 Clive GW0PPO

7795. Re: Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-07 16:50:50 UTC
From: Clive Jenner
Topic: 7751 Message: 7795

Just to show here is an ebay Item number: 200574965041 for a Proxxon KS115 looks a bargain compared with UK prices.

73 Clive GW0PPO

7796. Re: [spectrumanalyzer] Re: Cutting apart circuit board panels

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-07 20:07:03 UTC
From: aked101
Topic: 7751 Message: 7796

In North America, look for the Proxxon KS-115
(115 volts : KS230 -> 230 volts).

Have a look at:

http://www.proxxontools.com/store/pc/viewPrd.asp?idproduct=60

Al

7797. RBW Filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-08 13:29:16 UTC
From: Sam
Topic: 2188 Message: 7797

A while ago someone posted a photo of an RBW filter made with 2 or 3 ECS-10.7-7.5 cans. Does anyone know where that photo is?

I have put together a layout of a board that combines the RBW filter switch and four filters. Two are dual ceramic filters, probably 300 kHz and 61 kHz. One is a 3-can MCF filter, probably 7.5 kHz. The fourth is the amplifilter, which in my case came out to 525 Hz. Half of the switch-to-filter connections are made with traces. The remaining four would be made by direct-soldering 0.086" coax. This eliminates sixteen SMA connectors (8 on the switch, 2 on each filter), not to mention the mating connectors on the cables. It is still possible to add SMA connectors in case you want to make a substitution for one of the filters.

I have the board pretty much finalized, though I would like to hear from anybody who used the ECS filters to be sure I get the circuit right. The board is 3.6" x 2.4", which means it fills an ExpressPCB Miniboard. Three could be ordered at a cost of $20 per board. If there are interested builders, I can supply the layout, though I don't plan to replace my existing filters with this board and I don't want to be in charge of a group buy.

The RBW filters have always been every-man-for-himself, with people using whatever they can find or build. At this point, it seems to me that the ceramic filters are so simple that it is hard not to use them for the two widest filters, and the amplifilter is so simple and narrow that it is hard not to use that for the narrowest filter. The second most narrow filter is less well defined, and I can see some wanting to build it with the 5-crystal board, some with MCF, and some using canned filters. The reason I went for the MCF filter for this board is that it is the most compact and fits the available space. I will try a layout using the 5-crystal board in place of the ECS.

Sam W.

7798. How can I plot difference phase

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-08 16:56:27 UTC
From: ali reza
Topic: 7798 Message: 7798

Dear ALL

How can I plot difference phase (S12-S13) of a touchstone file in matlab software?

Sincerely

7799. Re: RBW Filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-08 20:44:03 UTC
From: Sam
Topic: 2188 Message: 7799

Things are looking better. I modified the layout to hold a 5-crystal filter, similar to Scotty's but I had a bit more room so I could add some trimmers and use a layout that will require a little less internal shielding. This replaces the layout for ECS cans, but if desired those could be used on the crystal layout. So the current board, which still fits the MiniBoard size, contains the RBW switch and four filters--two ceramic, the 5-crystal layout and the amplifilter. Note also that my 5-crystal layout is slightly larger than single-SLIM size, so if a different layout is desired for that filter, a regular SLIM module could be mounted right on this board, on top of the 5-crystal layout.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> A while ago someone posted a photo of an RBW filter made with 2 or 3 ECS-10.7-7.5 cans. Does anyone know where that photo is?
>
> I have put together a layout of a board that combines the RBW filter switch and four filters. Two are dual ceramic filters, probably 300 kHz and 61 kHz. One is a 3-can MCF filter, probably 7.5 kHz. The fourth is the amplifilter, which in my case came out to 525 Hz. Half of the switch-to-filter connections are made with traces. The remaining four would be made by direct-soldering 0.086" coax. This eliminates sixteen SMA connectors (8 on the switch, 2 on each filter), not to mention the mating connectors on the cables. It is still possible to add SMA connectors in case you want to make a substitution for one of the filters.
>
> I have the board pretty much finalized, though I would like to hear from anybody who used the ECS filters to be sure I get the circuit right. The board is 3.6" x 2.4", which means it fills an ExpressPCB Miniboard. Three could be ordered at a cost of $20 per board. If there are interested builders, I can supply the layout, though I don't plan to replace my existing filters with this board and I don't want to be in charge of a group buy.
>
> The RBW filters have always been every-man-for-himself, with people using whatever they can find or build. At this point, it seems to me that the ceramic filters are so simple that it is hard not to use them for the two widest filters, and the amplifilter is so simple and narrow that it is hard not to use that for the narrowest filter. The second most narrow filter is less well defined, and I can see some wanting to build it with the 5-crystal board, some with MCF, and some using canned filters. The reason I went for the MCF filter for this board is that it is the most compact and fits the available space. I will try a layout using the 5-crystal board in place of the ECS.
>
> Sam W.
>

7800. AmpliFilter with 10.11

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-08 20:50:35 UTC
From: Sam
Topic: 7800 Message: 7800

If anyone has a spare set of the 10.11 MHz crystals they could send me, I would appreciate it. I'll test them in the amplifilter. I can send them back to you. Or build the amplifilter and send it to me and I'll fine tune and return it (but send the crystals separately unless you have marked the frequency deviations of each). Or fine tune it yourself and let me know what component values you used.

Sam W.

7801. MSA collection PWB from last year

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-08 22:42:13 UTC
From: Steve
Topic: 7801 Message: 7801

I have the MSA collection PWB from a group buy in July, 2010. [Yeah, I'm a little slow getting around to things :-)]

There are three small PWB's each labeled F1 along the top and LFCN/HFCN along the bottom. What are those PWB's to be used for?

There are two small PWB's which look somewhat similar. One is labeled SER, the other is labeled SHNT. What are those PWB's to be used for?

With respect to the PWB labelled "Dual Ceramic Filter," is there a schematic somewhere for that board? Any documents regarding how to use it?

Thanks.

Steve K8JQ

--
Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

7802. Re: [spectrumanalyzer] AmpliFilter with 10.11

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-08 22:59:10 UTC
From: Jurgen
Topic: 7800 Message: 7802

What about if I send you the set you send me?

Jurgen

On 3/8/2011 3:50 PM, Sam wrote:
>
> If anyone has a spare set of the 10.11 MHz crystals they could send
> me, I would appreciate it. I'll test them in the amplifilter. I can
> send them back to you. Or build the amplifilter and send it to me and
> I'll fine tune and return it (but send the crystals separately unless
> you have marked the frequency deviations of each). Or fine tune it
> yourself and let me know what component values you used.
>
> Sam W.
>
>

7803. Re: RBW Filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-09 00:23:53 UTC
From: inlinebeginner
Topic: 2188 Message: 7803

Sam
I think you were talking about this 7.5kHz filter:
http://groups.yahoo.com/group/spectrumanalyzer/files/RBW%20Filters/Lin%27s_7.5kHz_MCF_rev3.pdf
I am using this filter. it works very well.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> A while ago someone posted a photo of an RBW filter made with 2 or 3 ECS-10.7-7.5 cans. Does anyone know where that photo is?
>
> I have put together a layout of a board that combines the RBW filter switch and four filters. Two are dual ceramic filters, probably 300 kHz and 61 kHz. One is a 3-can MCF filter, probably 7.5 kHz. The fourth is the amplifilter, which in my case came out to 525 Hz. Half of the switch-to-filter connections are made with traces. The remaining four would be made by direct-soldering 0.086" coax. This eliminates sixteen SMA connectors (8 on the switch, 2 on each filter), not to mention the mating connectors on the cables. It is still possible to add SMA connectors in case you want to make a substitution for one of the filters.
>
> I have the board pretty much finalized, though I would like to hear from anybody who used the ECS filters to be sure I get the circuit right. The board is 3.6" x 2.4", which means it fills an ExpressPCB Miniboard. Three could be ordered at a cost of $20 per board. If there are interested builders, I can supply the layout, though I don't plan to replace my existing filters with this board and I don't want to be in charge of a group buy.
>
> The RBW filters have always been every-man-for-himself, with people using whatever they can find or build. At this point, it seems to me that the ceramic filters are so simple that it is hard not to use them for the two widest filters, and the amplifilter is so simple and narrow that it is hard not to use that for the narrowest filter. The second most narrow filter is less well defined, and I can see some wanting to build it with the 5-crystal board, some with MCF, and some using canned filters. The reason I went for the MCF filter for this board is that it is the most compact and fits the available space. I will try a layout using the 5-crystal board in place of the ECS.
>
> Sam W.
>

7804. Re: AmpliFilter with 10.11

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-09 12:54:47 UTC
From: Sam
Topic: 7800 Message: 7804

Thanks, but those were probably 10.7 MHz. I want to test the ones Scotty and Jerry distributed, because many people have them. Jerry is going to send me some.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> What about if I send you the set you send me?
>
> Jurgen
>
>
> On 3/8/2011 3:50 PM, Sam wrote:
> >
> > If anyone has a spare set of the 10.11 MHz crystals they could send
> > me, I would appreciate it. I'll test them in the amplifilter. I can
> > send them back to you. Or build the amplifilter and send it to me and
> > I'll fine tune and return it (but send the crystals separately unless
> > you have marked the frequency deviations of each). Or fine tune it
> > yourself and let me know what component values you used.
> >
> > Sam W.
> >
> >
>

7805. How can I plot difference phase

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-09 13:01:31 UTC
From: ali reza
Topic: 7798 Message: 7805

Dear ALL

How can I plot difference phase (S12-S13) of a touchstone file in matlab software?

Sincerely

7806. Re: MSA collection PWB from last year

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-09 13:04:20 UTC
From: Sam
Topic: 7801 Message: 7806

The LFCN boards are for low or high pass filters using the MiniCircuits LFCN or HFCN devices. You just solder them on the board with connectors, and maybe capacitors.

SER and SHNT are for series and shunt fixtures, which are just attenuators on each end with a connection for the DUT in the middle. On SER, the DUT goes in series between the attenuators; on SHNT it goes shunt to ground. These can be used in place of bridges in Reflection mode, with or without OSL calibration. The shunt fixture is best for low impedances; series is best for high impedances.

I don't know if there is a schematic for the dual ceramic filter, but it is pretty self-explanatory. Two ceramics are cascaded directly with no coupling component, and LC impedance matching is stuck on each side. You design the match with RFSim99 based on the impedance of your filter, usually 330 or 470 ohms.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
>
> I have the MSA collection PWB from a group buy in July, 2010. [Yeah, I'm
> a little slow getting around to things :-)]
>
> There are three small PWB's each labeled F1 along the top and LFCN/HFCN
> along the bottom. What are those PWB's to be used for?
>
> There are two small PWB's which look somewhat similar. One is labeled
> SER, the other is labeled SHNT. What are those PWB's to be used for?
>
> With respect to the PWB labelled "Dual Ceramic Filter," is there a
> schematic somewhere for that board? Any documents regarding how to use it?
>
> Thanks.
>
> Steve K8JQ
>
> --
> Read

7807. Re: How can I plot difference phase

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-09 13:07:07 UTC
From: Sam
Topic: 7798 Message: 7807

I know nothing about matlab, but it sounds like something quite easy to find in the manual.
Read a file. Subtract.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, ali reza <alirezant2006@...> wrote:
>
>
>
>
>
>
> Dear ALL
>
> How can I plot difference phase (S12-S13) of a touchstone file in matlab
> software?
>
> Sincerely
>

7808. Re: RBW Filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-09 15:36:25 UTC
From: Sam
Topic: 2188 Message: 7808

That's the one. Thanks. Its a File rather than a Photo, which is why I didn't find it. I didn't realize that for the third MCF can you used 15 kHz rather than 7.5 kHz, which I imagine you did because its spurious response wouldn't line up with that of the other two cans. Good idea.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> I think you were talking about this 7.5kHz filter:
> http://groups.yahoo.com/group/spectrumanalyzer/files/RBW%20Filters/Lin%27s_7.5kHz_MCF_rev3.pdf
> I am using this filter. it works very well.
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > A while ago someone posted a photo of an RBW filter made with 2 or 3 ECS-10.7-7.5 cans. Does anyone know where that photo is?
> >
> > I have put together a layout of a board that combines the RBW filter switch and four filters. Two are dual ceramic filters, probably 300 kHz and 61 kHz. One is a 3-can MCF filter, probably 7.5 kHz. The fourth is the amplifilter, which in my case came out to 525 Hz. Half of the switch-to-filter connections are made with traces. The remaining four would be made by direct-soldering 0.086" coax. This eliminates sixteen SMA connectors (8 on the switch, 2 on each filter), not to mention the mating connectors on the cables. It is still possible to add SMA connectors in case you want to make a substitution for one of the filters.
> >
> > I have the board pretty much finalized, though I would like to hear from anybody who used the ECS filters to be sure I get the circuit right. The board is 3.6" x 2.4", which means it fills an ExpressPCB Miniboard. Three could be ordered at a cost of $20 per board. If there are interested builders, I can supply the layout, though I don't plan to replace my existing filters with this board and I don't want to be in charge of a group buy.
> >
> > The RBW filters have always been every-man-for-himself, with people using whatever they can find or build. At this point, it seems to me that the ceramic filters are so simple that it is hard not to use them for the two widest filters, and the amplifilter is so simple and narrow that it is hard not to use that for the narrowest filter. The second most narrow filter is less well defined, and I can see some wanting to build it with the 5-crystal board, some with MCF, and some using canned filters. The reason I went for the MCF filter for this board is that it is the most compact and fits the available space. I will try a layout using the 5-crystal board in place of the ECS.
> >

> > Sam W.
> >
>

7809. Re: MSA collection PWB from last year

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-09 20:10:29 UTC
From: Sam
Topic: 7801 Message: 7809

A test fixture made with the SER board is shown here:

<http://www.wetterlin.org/sam/SA/Operation/TestFixtures.pdf>

on p. 12.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> The LFCN boards are for low or high pass filters using the MiniCircuits LFCN or HFCN devices. You just solder them on the board with connectors, and maybe capacitors.
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> > With respect to the PWB labelled "Dual Ceramic Filter," is there a
> > schematic somewhere for that board? Any documents regarding how to use it?
> >
> > Thanks.
> >
> > Steve K8JQ
> >
> > --
> > Read

>

7810. Re: [spectrumanalyzer] Re: MSA collection PWB from last year

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-10 01:21:43 UTC
From: Steve
Topic: 7801 Message: 7810

Sam,

Thanks for the info!

Steve K8JQ

On 3/9/2011 8:04 AM, Sam wrote:
> The LFCN boards are for low or high pass filters using the MiniCircuits LFCN or HFCN devices. You just solder them on the board with connectors, and maybe capacitors.
>
> SER and SHNT are for series and shunt fixtures, which are just attenuators on each end with a connection for the DUT in the middle. On SER, the DUT goes in series between the attenuators; on SHNT it goes shunt to ground. These can be used in place of bridges in Reflection mode, with or without OSL calibration. The shunt fixture is best for low impedances; series is best for high impedances.
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> Sam W.
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>>
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>>
>> --
>> Read
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> Yahoo! Groups Links
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Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

7811. VGA VMAG reference

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-10 18:49:55 UTC
From: davidhooau
Topic: 7811 Message: 7811

Hi folks,

The schematics for Sam's VGA (9/25/10) show a 2.5V shunt reference and a resistive divider to set the VMAG level for the AD8330, which makes sense to me.

The PCB (9/23/10) has the ref diode in series between R5 and R4, which will set VMAG to 833mV instead of the desired 1.2V (approx).

Can Sam please confirm that the schematics are indeed correct?

An easy fix would be to short pins 2 and 3 of the SOT-23 and then solder the diode (rotated by 180deg) between the input trace from R5 and ground.

Cheers,

davidh

7812. Re: VGA VMAG reference

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-10 19:37:00 UTC
From: Sam
Topic: 7811 Message: 7812

You are right; the PCB has an error. This was pointed out before, and I'm sure I corrected the PCB, but I now can't find the fixed version. So I did a new fixed version and put it on my website in place of the old one. The schematic is correct.

As far as using the existing board, be sure pin 2 gets grounded, pin 3 gets connected to a line connecting R4 and R5, and pin 1 is floating or grounded, all as shown on the schematic. Pin 1 is the pin all by itself on one side; then you number 2 and 3 clockwise. All this can be done by rotating the diode and making sure the trace leaving R4 makes it all the way to R5.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Hi folks,
>
> The schematics for Sam's VGA (9/25/10) show a 2.5V shunt reference and a resistive divider to set the VMAG level for the AD8330, which makes sense to me.
>
> The PCB (9/23/10) has the ref diode in series between R5 and R4, which will set VMAG to 833mV instead of the desired 1.2V (approx).
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>
> Cheers,
>
> davidh
>

7813. Re: RBW Filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-10 19:47:23 UTC
From: inlinebeginner
Topic: 2188 Message: 7813

Sam
The third 15kHz MCF is just used to suppress the spurs. It works very well.
Lin
--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> That's the one. Thanks. Its a File rather than a Photo, which is why I didn't find it. I didn't realize that for the third MCF can you used 15 kHz rather than 7.5 kHz, which I imagine you did because its spurious response wouldn't line up with that of the other two cans. Good idea.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
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> > Sam
> > I think you were talking about this 7.5kHz filter:
> > http://groups.yahoo.com/group/spectrumanalyzer/files/RBW%20Filters/Lin%27s_7.5kHz_MCF_rev3.pdf
> > I am using this filter. it works very well.
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> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > > A while ago someone posted a photo of an RBW filter made with 2 or 3 ECS-10.7-7.5 cans. Does anyone know where that photo is?
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> > > I have put together a layout of a board that combines the RBW filter switch and four filters. Two are dual ceramic filters, probably 300 kHz and 61 kHz. One is a 3-can MCF filter, probably 7.5 kHz. The fourth is the amplifilter, which in my case came out to 525 Hz. Half of the switch-to-filter connections are made with traces. The remaining four would be made by direct-soldering 0.086" coax. This eliminates sixteen SMA connectors (8 on the switch, 2 on each filter), not to mention the mating connectors on the cables. It is still possible to add SMA connectors in case you want to make a substitution for one of the filters.
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most narrow filter is less well defined, and I can see some wanting to build it with the 5-crystal board, some with MCF, and some using canned filters. The reason I went for the MCF filter for this board is that it is the most compact and fits the available space. I will try a layout using the 5-crystal board in place of the ECS.
> > >
> > > Sam W.
> > >
> >
>

7814. Amplifiter tuning help

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-11 08:18:25 UTC
From: davidhooau
Topic: 7814 Message: 7814

Folks,

I've built an amplifilter using 4 crystals matched within 20Hz. You'll find some happy snaps in the davidh photo folder, and I'd like some advice on tuning it please. The images were taken using DDS1 as a signal source, as I don't yet have a good RBW filter to use the SSA as a VNA. The filter has no shielding or fences yet.

> There's an obvious asymmetry, which I suspect is due to the input and output matching networks being incorrect. Prior to the crystals being installed, I jumpered across the 2 crystal pairs and found the overall LPF response a little on the low side (maybe 1dB down at 10.7MHz). Would this explain the asymmetry?

> There are some little peaks visible in the 300kHz and 3MHz wide traces, always at the same locations. How might I approach fixing these up?

Many thanks,

davidh

7815. Re: [spectrumanalyzer] Amplifiter tuning help

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-11 12:32:47 UTC
From: william sprowls
Topic: 7814 Message: 7815

Hi David,
 You have a good looking 600 Hz filter. The asymmetry is as expected. The upper skirt will have a steeper response than the lower skirt, due to each crystal's parallel resonance. This occurs about 20 to 30 Khz above center frequency. There is nothing you can do about that, and there is no need to have a perfect symmetric response, anyway.
  There looks to be a very minor skirt perturbation at -90 dBm. I'm inclined to believe that your magnitude calibration between -80 and -100 dBm is not exact, and that would explain it.
  The "little peaks" are DDS spurs. They don't need "fixing" because they will not be there when you place this filter in one of your Resolution Paths.
 The DDS does make a fantastic, low noise signal source. But its downside is lotsa spurs. This is why the DDS module contains a crystal filter, to reduce those spurs before reaching the PLO module.
 Bottom line, do nothing other than add your shielding and take data again. I'm thinking you may see no difference at all. This is a good looking response, as is.
Scotty

--- On Fri, 3/11/11, davidhooau <dhooke@gmail.com> wrote:

From: davidhooau <dhooke@...>
Subject: [spectrumanalyzer] Amplifiter tuning help
To: spectrumanalyzer@yahoogroups.com
Date: Friday, March 11, 2011, 2:18 AM

Folks,

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Many thanks,

davidh

7816. Re: Amplifiter tuning help

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-11 13:23:26 UTC
From: Sam
Topic: 7814 Message: 7816

Yes, this is excellent, exactly the way it should be. In actual use in the MSA, I don't believe you will ever see the profile of the narrow filter response below about -65 dBc (due to phase noise effects), so the minor asymmetry at low levels will become invisible. The important factor is that the top is very symmetric and has no ripple.

I'm curious as to your component values. Did you change any of the schematic components? Did you include the trimmers? (either as trimmers or as fixed caps?) My LPF also peaked a little lower than the design value. I decreased the inductors to 560 nH which moved the peak upward, but had minimal effect on overall filter performance.

I can't tell the insertion loss from the SA scan, but if it is too high or low (-2 dB is a good target) you can adjust the op amp gain.

If you prefer a flatter top, you can increase the coupling by reducing the 330 pF caps. That will also reduce the insertion loss and affect the ideal op amp setting. I like a somewhat flattened top, but not if it causes asymmetry or ripple--sometimes flat tops get tilted. Currently, mine looks just like yours.

My goal was to design a narrow filter that would work well "out of the box" without a lot of sensitive adjustments. So far so good.

One other thing you might test is whether you can get the output up to 10 dBm. With a +5V supply and the OPA356, mine maxes out at 9 dBm, which is fine. For anyone using the Expanded Log Detector, the max output is not be an issue at all.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi David,
> Â You have a good looking 600 Hz filter. The asymmetry is as expected. The upper skirt will have a steeper response than the lower skirt, due to each crystal's parallel resonance. This occurs about 20 to 30 Khz above center frequency. There is nothing you can do about that, and there is no need to have a perfect symmetric response, anyway.
> Â There looks to be a very minor skirt perturbation at -90 dBm. I'm inclined to believe that your magnitude calibration between -80 and -100 dBm is not exact, and that would explain it.
> Â The "little peaks" are DDS spurs. They don't need "fixing" because they will not be there when you place this filter in one of your Resolution Paths.
> Â The DDS does make a fantastic, low noise signal source. But its downside is lotsa spurs. This is why the DDS module contains a crystal filter, to reduce those spurs before reaching the PLO module.
> Â Bottom line, do nothing other than add your shielding and take data again. I'm thinking you may see no difference at all. This is a good looking response, as is.
> Scotty
>
> --- On Fri, 3/11/11, davidhooau <dhooke@...> wrote:

>
> From: davidhooau <dhooke@...>
> Subject: [spectrumanalyzer] Amplifiter tuning help
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, March 11, 2011, 2:18 AM
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> > There are some little peaks visible in the 300kHz and 3MHz wide traces, always at the same locations. How might I approach fixing these up?
>
>
>
> Many thanks,
>
>
>
> davidh

>

7817. Re: Amplifiter tuning help

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-11 21:17:53 UTC
From: davidhooau
Topic: 7814 Message: 7817

Hi Sam and Scotty,

So much to learn (but it's so much fun)!

I can get +12dBm from it, which is where my LD saturates, using an OPA842 and an 8V rail; this is using an external sig gen at the centre of the filter. When I get a good second RWB filter working, I'll test again in VNA mode.

Using schematic specified components around the amplifier, insertion gain is +1.8dB.

I have a very limited stock of Ls and Cs (I'll end up spending a few hundred on the SSA and lots more on a decent parts bin), so most of the capacitor values are way off. No trimming performed at all yet.

L1, L2: 680u nom, R: 2.4 Qmin: 22@30MHz
C1, C8: 490pF
C2, C7: 440pF
C4, C5: 320pF
C3, C9, C13, C6: 10nF

Are all of the shields required, or should I hold off until further experiments are performed?

Cheers, and thanks!

davidh

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Yes, this is excellent, exactly the way it should be. In actual use in the MSA, I don't believe you will ever see the profile of the narrow filter response below about -65 dBc (due to phase noise effects), so the minor asymmetry at low levels will become invisible. The important factor is that the top is very symmetric and has no ripple.
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> > Scotty
> >
> > --- On Fri, 3/11/11, davidhooau <dhooke@> wrote:
> >
> > From: davidhooau <dhooke@>
> > Subject: [spectrumanalyzer] Amplifiter tuning help
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Friday, March 11, 2011, 2:18 AM
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> > Many thanks,
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> >
> >
> > davidh
> >
>

7818. Q of notch filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-11 21:23:21 UTC
From: Sam
Topic: 7818 Message: 7818

Here is a very basic electronics question. The Q of a filter equals center frequency over bandwidth. The bandwidth is determined as the frequency difference between the 3 dB points.

The question is, for a notch filter are the "3 dB points" 3 dB down from the top or up from the bottom of the notch.

Several sources indicate that you go 3 dB down from the top whether you have a band pass or band stop filter. For example,

<http://www-k.ext.ti.com/SRVS/Data/ti/KnowledgeBases/analog/document/faq\
s/q.htm>

makes this statement:

"Q is defined as the Quality Factor of a bandpass or notch filter. It is defined as the center frequency of a filter divided by the bandwidth. The bandwidth is the frequency of the upper 3 dB roll-off point minus the frequency of the lower 3 dB roll-off point."

Now, the definition of Q using 3 dB points has to jibe with the definition for LC filters, using reactance and resistance. For a series LC filter, the unloaded Q is the reactance of L at resonance, divided by the series resistance.

Here is some data from RFSim99: Place a series LC circuit shunt to ground between a 1 kohm source and load (so it is nearly unloaded). Make C=1 nF and L=1 uH with a series R of 1 ohm. It resonates at 5.04 MHz. The reactance of L at resonance is 31.7 ohms. Therefore Q by the reactance/resistance method is 31.7/1=31.7.

The 3 dB bandwidth is 0.157 MHz if you use points 3 dB above the bottom of the notch. It is 80.9 MHz if you use points 3 dB from the top (i.e. absolute -3 dB level). Dividing center frequency by bandwidth gives you Q=32.1 for the from-the-bottom points and Q=0.062 using the from-the-top points.

Obviously, you need to measure the 3 dB points relative to the bottom of the notch if you want to get the same Q value using freq/BW as you do with reactance/resistance, right?

Ah, but here is the catch. I stated above that I used 1 kohm source and load so the LC would be nearly unloaded, but if you view those 1 k resistances as becoming part of the series LC circuit, higher resistance actually creates more dissipation and reduces the Q. In fact, the Q=0.062 value calculated above using absolute -3 dB points is almost exactly L reactance (31.7) divided by series resistance (in this case

considered to be 1 + 1k||1k = 501 ohms).

If you view the notch starting with a low source and load resistance and then increase those resistances, the width of the notch at the top becomes wider and wider, reflecting the lower Q that results when you include the source and load (in parallel) as part of the series resistance of the series LC circuit. The bottom of the notch, however, initially narrows somewhat as the source and load increase, but once they get much bigger than the 1 ohm series resistance there is not much change. Large source and load make the top wider and small ones make the bottom wider.

My conclusion is that you could define Q using either the top or bottom pair of 3 dB points, and that definition will be consistent with the reactance/resistance definition, provided that you properly calculate the resistance. If you use the top 3 dB points, the effective series resistance of the LC circuit is the sum of the 1 ohm explicit series resistance plus the parallel combo of the source and load (meaning large source/load values reduce Q). If you use the bottom 3 dB points to define Q by the bandwidth method, you need to treat the source and load as being a "parallel load" on the circuit (meaning large source/load values increase Q); I can understand that parallel treatment qualitatively but I'm not sure of the mathematics--how do you combine the effects of the 1 ohm series resistance and the 500 ohm parallel resistance (500 being 1k||1k).

It does appear that the formal definition of Q for a notch filter uses the top 3 dB points. That's what Transmission mode RLC analysis currently uses. It has the drawback that the 3 dB points are typically very far apart--you get Q values like the 0.062 value above. If those points are used, you are much better off using a very low impedance fixture, which will give a narrower notch.

A corollary of all this is that if the parallel combo of the source and load resistances is at least 10 times the internal series resistance of the LC circuit (here, 1 ohm), then Q determined with the upper 3 dB points will be the loaded Q (QL) of the circuit, and Q determined with the bottom 3 dB points will be very close to the unloaded Q of the circuit.

I'm still trying to decide how all this affects the optimum way to perform RLC analysis.

Sam W.

7819. Re: Amplifiter tuning help

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-11 21:32:58 UTC
From: Sam
Topic: 7814 Message: 7819

If you get 12 dBm, you're in good shape.

I hope your "680u" inductor is really "680n".

A lot of shielding is provided for, because I didn't know how much would be needed. The shields don't have to connect to the lid to be effective at this frequency, so they are not hard to add. It may be that no internal shielding is needed; however, I would at least add enough that area from the board input through the input of the second crystal is isolated from the rest of the circuit. I wouldn't add them until you're not likely to have to change any components, because they may get in the way.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Hi Sam and Scotty,
>
> So much to learn (but it's so much fun)!
>
> I can get +12dBm from it, which is where my LD saturates, using an OPA842 and an 8V rail; this is using an external sig gen at the centre of the filter. When I get a good second RWB filter working, I'll test again in VNA mode.
>
> Using schematic specified components around the amplifier, insertion gain is +1.8dB.
>
> I have a very limited stock of Ls and Cs (I'll end up spending a few hundred on the SSA and lots more on a decent parts bin), so most of the capacitor values are way off. No trimming performed at all yet.
>
> L1, L2: 680u nom, R: 2.4 Qmin: 22@30MHz
> C1, C8: 490pF
> C2, C7: 440pF
> C4, C5: 320pF
> C3, C9, C13, C6: 10nF
>
> Are all of the shields required, or should I hold off until further experiments are performed?
>
> Cheers, and thanks!
>
> davidh
>
>
> --- In spectrumanalyzer@...m, "Sam" <swetterlin@> wrote:
> >
> > Yes, this is excellent, exactly the way it should be. In actual use in the MSA, I don't

believe you will ever see the profile of the narrow filter response below about -65 dBc (due to phase noise effects), so the minor asymmetry at low levels will become invisible. The important factor is that the top is very symmetric and has no ripple.
> >
> > I'm curious as to your component values. Did you change any of the schematic components? Did you include the trimmers? (either as trimmers or as fixed caps?) My LPF also peaked a little lower than the design value. I decreased the inductors to 560 nH which moved the peak upward, but had minimal effect on overall filter performance.
> >
> > I can't tell the insertion loss from the SA scan, but if it is too high or low (-2 dB is a good target) you can adjust the op amp gain.
> >
> > If you prefer a flatter top, you can increase the coupling by reducing the 330 pF caps. That will also reduce the insertion loss and affect the ideal op amp setting. I like a somewhat flattened top, but not if it causes asymmetry or ripple--sometimes flat tops get tilted. Currently, mine looks just like yours.
> >
> > My goal was to design a narrow filter that would work well "out of the box" without a lot of sensitive adjustments. So far so good.
> >
> > One other thing you might test is whether you can get the output up to 10 dBm. With a +5V supply and the OPA356, mine maxes out at 9 dBm, which is fine. For anyone using the Expanded Log Detector, the max output is not be an issue at all.
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > >
> > > Hi David,
> > > Â You have a good looking 600 Hz filter. The asymmetry is as expected. The upper skirt will have a steeper response than the lower skirt, due to each crystal's parallel resonance. This occurs about 20 to 30 Khz above center frequency. There is nothing you can do about that, and there is no need to have a perfect symmetric response, anyway.
> > > Â There looks to be a very minor skirt perturbation at -90 dBm. I'm inclined to believe that your magnitude calibration between -80 and -100 dBm is not exact, and that would explain it.
> > > Â The "little peaks" are DDS spurs. They don't need "fixing" because they will not be there when you place this filter in one of your Resolution Paths.
> > > Â The DDS does make a fantastic, low noise signal source. But its downside is lotsa spurs. This is why the DDS module contains a crystal filter, to reduce those spurs before reaching the PLO module.
> > > Â Bottom line, do nothing other than add your shielding and take data again. I'm thinking you may see no difference at all. This is a good looking response, as is.
> > > Scotty
> > >
> > > --- On Fri, 3/11/11, davidhooau <dhooke@> wrote:
> > >
> > > From: davidhooau <dhooke@>
> > > Subject: [spectrumanalyzer] Amplifiter tuning help
> > > To: spectrumanalyzer@yahoogroups.com
> > > Date: Friday, March 11, 2011, 2:18 AM

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> > > Folks,
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> > >
> > > I've built an amplifilter using 4 crystals matched within 20Hz. You'll find some happy snaps in the davidh photo folder, and I'd like some advice on tuning it please. The images were taken using DDS1 as a signal source, as I don't yet have a good RBW filter to use the SSA as a VNA. The filter has no shielding or fences yet.
> > >
> > >
> > >
> > > > There's an obvious asymmetry, which I suspect is due to the input and output matching networks being incorrect. Prior to the crystals being installed, I jumpered across the 2 crystal pairs and found the overall LPF response a little on the low side (maybe 1dB down at 10.7MHz). Would this explain the asymmetry?
> > >
> > >
> > >
> > > > There are some little peaks visible in the 300kHz and 3MHz wide traces, always at the same locations. How might I approach fixing these up?
> > >
> > >
> > >
> > > Many thanks,
> > >
> > >
> > >
> > > davidh
> > >
> >
>

7820. VGA noise filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-12 03:59:21 UTC
From: davidhooau
Topic: 7820 Message: 7820

Folks,

Does anyone has access to the data-sheet of the sfecv10m7cq that's been specified for the VGA noise filter?

I've posted the response of the sample I built in the photo section, but without the data, am in no position to make a about its acceptability.

Thanks,

davidh

7821. Re: VGA noise filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-12 04:14:07 UTC
From: n6tdt
Topic: 7820 Message: 7821

David

Try this link, Not sure it is what you want but was the only thing that came up for a search on that part number.

http://datasheetz.com/data/Filters/Ceramic/490-1231-6-datasheetz.html

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Folks,
>
> Does anyone has access to the data-sheet of the sfecv10m7cq that's been specified for the VGA noise filter?
>
> I've posted the response of the sample I built in the photo section, but without the data, am in no position to make a about its acceptability.
>
> Thanks,
>
> davidh
>

7822. SSA first real image

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-12 08:57:01 UTC
From: davidhooau
Topic: 7822 Message: 7822

Oh Wise Ones,

I've posted a happy snap of my SSA's first "real" scan: "ssa_100M_first_image" in the davidh photo folder. I'd really appreciate comments on how it looks.

> MXR1 has 2.5dB attenuator built into input.

> Cavity filter needs work! 6.5dB insertion loss, 2.6MHz BW.

> 40dB IF amplifier

> Sam's wonderful amplifilter

> System calibrated (roughly) and levels shown at LD input. Overall levels are about 3dB more than I expected which I'll work on tomorrow..

> LO2 isolation amplifier in situ.

> TG buffer in situ.

> Fences in place, but no lids on any of the modules yet.

I'd like to understand the signals at markers 1 and 2, and confirmation that the LO1 and LO2 phase noise isn't excessive.

Many thanks.

davidh

7823. Re: [spectrumanalyzer] VGA noise filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-12 12:14:14 UTC
From: Jurgen
Topic: 7820 Message: 7823
Attachments: 1 described; binary payloads are missing from this source WARC

Look at the digikey # 490-1231-1-nd. This part works fine, I use it.
They have a datasheet on their site. See the attached.
The complete part number is SFECV10M7CQ0C01-R0.
10.7MHz 500kHz bandwidth.

Jurgen

On 3/11/2011 10:59 PM, davidhooau wrote:
>
> Folks,
>
> Does anyone has access to the data-sheet of the sfecv10m7cq that's
> been specified for the VGA noise filter?
>
> I've posted the response of the sample I built in the photo section,
> but without the data, am in no position to make a about its acceptability.
>
> Thanks,
>
> davidh
>
>

7824. Re: [spectrumanalyzer] SSA first real image

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-12 14:06:50 UTC
From: william sprowls
Topic: 7822 Message: 7824

Hi David,
 Good going. Phase noise at the bottom of the skirt looks like -90.8 dBc/1Hz. Right on target for -91. If your spurs at the markers are consistent, then go into the Sweep parameters window and select the spur test. If they go away or change position, do not worry about them.
Scotty

--- On Sat, 3/12/11, davidhooau <dhooke@...> wrote:

From: davidhooau <dhooke@...>
Subject: [spectrumanalyzer] SSA first real image
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, March 12, 2011, 2:57 AM

Oh Wise Ones,

I've posted a happy snap of my SSA's first "real" scan: "ssa_100M_first_image" in the davidh photo folder. I'd really appreciate comments on how it looks.

> MXR1 has 2.5dB attenuator built into input.

> Cavity filter needs work! 6.5dB insertion loss, 2.6MHz BW.

> 40dB IF amplifier

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> System calibrated (roughly) and levels shown at LD input. Overall levels are about 3dB more than I expected which I'll work on tomorrow..

> LO2 isolation amplifier in situ.

> TG buffer in situ.

> Fences in place, but no lids on any of the modules yet.

I'd like to understand the signals at markers 1 and 2, and confirmation that the LO1 and LO2 phase noise isn't excessive.

Many thanks.

davidh

7825. Re: VGA noise filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-12 14:21:29 UTC
From: Sam
Topic: 7820 Message: 7825

David,
In the SamW--RBWFilters photo album are photos of various dual ceramic filters, one of which is the one you mention. That shows the response I got. In the Files section, in RBW Filters folder, I just posted specs for Murata Cerafil ceramics. It doesn't have our exact part number, but SFECF10M7CQ00-R0 seems to be similar.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "n6tdt" <dhellis@...> wrote:
>
> David
>
> Try this link, Not sure it is what you want but was the only thing that came up for a search on that part number.
>
> http://datasheetz.com/data/Filters/Ceramic/490-1231-6-datasheetz.html
>
> --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> >
> > Folks,
> >
> > Does anyone has access to the data-sheet of the sfecv10m7cq that's been specified for the VGA noise filter?
> >
> > I've posted the response of the sample I built in the photo section, but without the data, am in no position to make a about its acceptability.
> >
> > Thanks,
> >
> > davidh
> >
>

7826. Re: VGA noise filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-12 14:44:55 UTC
From: Sam
Topic: 7820 Message: 7826

David,
I should also point out that for the noise filter the shape of the top is not critical, as long as it is not so ugly as to impose ripple on the narrower RBW filters that fit within its bandwidth. Your noise filter has a reasonably curved peak response. For example, if you use a 7 kHz RBW filter, There will be no signals very far outside the 7 kHz bandwidth, so the response of the noise filter at, say, +/-30 kHz from center is irrelevant as far as shaping the signal image. Within the range that a 7 kHz RBW filter cares about, your noise filter is essentially flat. For a wide RBW filter, like 300 kHz, the curvature of the noise filter peak will slightly round the effective shape of the RBW filter and slightly steepen its skirts.

The spurs don't matter because the total noise within them will be small, as long as your impedance matching is the normal LC low pass topology, causing the attenuation to gradually increase beyond maybe 15 MHz. That means the vast bulk of noise power is between the -3 dB points. These spurs never show up on screen, because no signals at those frequencies reach the noise filter.

If you wanted to play with the shape, you could add or remove a bit of capacitance from the impedance matching and see what happens. I don't think the ceramics are very sensitive to such capacitance changes, so you might have to make large changes to have an effect. (e.g. change by 20 pF rather than 2 pF). The optimum setting might involve an increase on one side and a decrease on the other.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> David,
> In the SamW--RBWFilters photo album are photos of various dual ceramic filters, one of which is the one you mention. That shows the response I got. In the Files section, in RBW Filters folder, I just posted specs for Murata Cerafil ceramics. It doesn't have our exact part number, but SFECF10M7CQ00-R0 seems to be similar.
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> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, "n6tdt" <dhellis@> wrote:
> >
> > David
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> >
> > http://datasheetz.com/data/Filters/Ceramic/490-1231-6-datasheetz.html
> >
> > --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:

> > >
> > > Folks,
> > >
> > > Does anyone has access to the data-sheet of the sfecv10m7cq that's been specified for the VGA noise filter?
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> > > I've posted the response of the sample I built in the photo section, but without the data, am in no position to make a about its acceptability.
> > >
> > > Thanks,
> > >
> > > davidh
> > >
> >
>

7827. Re: VGA noise filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-13 04:03:03 UTC
From: davidhooau
Topic: 7820 Message: 7827

Sam,

Many thanks for the explanation. I was only able to move the response a tiny bit, but enough to help with filters up to about 30kHz. I've posted before and after images.

Cheers,

davidh

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> David,
> I should also point out that for the noise filter the shape of the top is not critical, as long as it is not so ugly as to impose ripple on the narrower RBW filters that fit within its bandwidth. Your noise filter has a reasonably curved peak response. For example, if you use a 7 kHz RBW filter, There will be no signals very far outside the 7 kHz bandwidth, so the response of the noise filter at, say, +/-30 kHz from center is irrelevant as far as shaping the signal image. Within the range that a 7 kHz RBW filter cares about, your noise filter is essentially flat. For a wide RBW filter, like 300 kHz, the curvature of the noise filter peak will slightly round the effective shape of the RBW filter and slightly steepen its skirts.
>
> The spurs don't matter because the total noise within them will be small, as long as your impedance matching is the normal LC low pass topology, causing the attenuation to gradually increase beyond maybe 15 MHz. That means the vast bulk of noise power is between the -3 dB points. These spurs never show up on screen, because no signals at those frequencies reach the noise filter.
>
> If you wanted to play with the shape, you could add or remove a bit of capacitance from the impedance matching and see what happens. I don't think the ceramics are very sensitive to such capacitance changes, so you might have to make large changes to have an effect. (e.g. change by 20 pF rather than 2 pF). The optimum setting might involve an increase on one side and a decrease on the other.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > David,
> > In the SamW--RBWFilters photo album are photos of various dual ceramic filters, one of which is the one you mention. That shows the response I got. In the Files section, in RBW Filters folder, I just posted specs for Murata Cerafil ceramics. It doesn't have our exact part number, but SFECF10M7CQ00-R0 seems to be similar.
> >
> > Sam W.
> >

> >
> > --- In spectrumanalyzer@yahoogroups.com, "n6tdt" <dhellis@> wrote:
> > >
> > > David
> > >
> > > Try this link, Not sure it is what you want but was the only thing that came up for a search on that part number.
> > >
> > > http://datasheetz.com/data/Filters/Ceramic/490-1231-6-datasheetz.html
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> > > >
> > > > Folks,
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> > > > Does anyone has access to the data-sheet of the sfecv10m7cq that's been specified for the VGA noise filter?
> > > >
> > > > I've posted the response of the sample I built in the photo section, but without the data, am in no position to make a about its acceptability.
> > > >
> > > > Thanks,
> > > >
> > > > davidh
> > > >
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>

7828. Re: SSA first real image

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-13 04:09:48 UTC
From: davidhooau
Topic: 7822 Message: 7828

Hi Scotty,

Thanks for your encouraging words.

The spurs were indeed from the DDS. Soon I'll put covers on all of the slims and search for some real spurs in earnest.

davidh

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi David,
> Â Good going. Phase noise at the bottom of the skirt looks like -90.8 dBc/1Hz. Right on target for -91. If your spurs at the markers are consistent, then go into the Sweep parameters window and select the spur test. If they go away or change position, do not worry about them.
> Scotty
>
> --- On Sat, 3/12/11, davidhooau <dhooke@...> wrote:
>
> From: davidhooau <dhooke@...>
> Subject: [spectrumanalyzer] SSA first real image
> To: spectrumanalyzer@yahoogroups.com
> Date: Saturday, March 12, 2011, 2:57 AM
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> Oh Wise Ones,
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> I've posted a happy snap of my SSA's first "real" scan: "ssa_100M_first_image" in the

davidh photo folder. I'd really appreciate comments on how it looks.
>
>
>
> > MXR1 has 2.5dB attenuator built into input.
>
>
>
> > Cavity filter needs work! 6.5dB insertion loss, 2.6MHz BW.
>
>
>
> > 40dB IF amplifier
>
>
>
> > Sam's wonderful amplifilter
>
>
>
> > System calibrated (roughly) and levels shown at LD input. Overall levels are about 3dB more than I expected which I'll work on tomorrow..
>
>
>
> > LO2 isolation amplifier in situ.
>
>
>
> > TG buffer in situ.
>
>
>
> > Fences in place, but no lids on any of the modules yet.
>
>
>
> I'd like to understand the signals at markers 1 and 2, and confirmation that the LO1 and LO2 phase noise isn't excessive.
>
>
>
> Many thanks.
>
>
>
> davidh
>

7829. Re: VGA noise filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-13 14:27:14 UTC
From: Sam
Topic: 7820 Message: 7829

That looks good and should work fine. There is probably no need for further adjustment, but another way to adjust the ceramic filters is simply to replace one or both ceramics. They are cheap, and the tolerance for their center frequencies is quite large, so you might be able to move the center frequency upwards with a different filter.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Sam,
>
> Many thanks for the explanation. I was only able to move the response a tiny bit, but enough to help with filters up to about 30kHz. I've posted before and after images.
>
> Cheers,
>
> davidh
>
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > David,
> > I should also point out that for the noise filter the shape of the top is not critical, as long as it is not so ugly as to impose ripple on the narrower RBW filters that fit within its bandwidth. Your noise filter has a reasonably curved peak response. For example, if you use a 7 kHz RBW filter, There will be no signals very far outside the 7 kHz bandwidth, so the response of the noise filter at, say, +/-30 kHz from center is irrelevant as far as shaping the signal image. Within the range that a 7 kHz RBW filter cares about, your noise filter is essentially flat. For a wide RBW filter, like 300 kHz, the curvature of the noise filter peak will slightly round the effective shape of the RBW filter and slightly steepen its skirts.
> >
> > The spurs don't matter because the total noise within them will be small, as long as your impedance matching is the normal LC low pass topology, causing the attenuation to gradually increase beyond maybe 15 MHz. That means the vast bulk of noise power is between the -3 dB points. These spurs never show up on screen, because no signals at those frequencies reach the noise filter.
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> > If you wanted to play with the shape, you could add or remove a bit of capacitance from the impedance matching and see what happens. I don't think the ceramics are very sensitive to such capacitance changes, so you might have to make large changes to have an effect. (e.g. change by 20 pF rather than 2 pF). The optimum setting might involve an increase on one side and a decrease on the other.
> >
> > Sam W.

> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > David,
> > > In the SamW--RBWFilters photo album are photos of various dual ceramic filters, one of which is the one you mention. That shows the response I got. In the Files section, in RBW Filters folder, I just posted specs for Murata Cerafil ceramics. It doesn't have our exact part number, but SFECF10M7CQ00-R0 seems to be similar.
> > >
> > > Sam W.
> > >
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "n6tdt" <dhellis@> wrote:
> > > >
> > > > David
> > > >
> > > > Try this link, Not sure it is what you want but was the only thing that came up for a search on that part number.
> > > >
> > > > http://datasheetz.com/data/Filters/Ceramic/490-1231-6-datasheetz.html
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> > > > >
> > > > > Folks,
> > > > >
> > > > > Does anyone has access to the data-sheet of the sfecv10m7cq that's been specified for the VGA noise filter?
> > > > >
> > > > > I've posted the response of the sample I built in the photo section, but without the data, am in no position to make a about its acceptability.
> > > > >
> > > > > Thanks,
> > > > >
> > > > > davidh
> > > > >
> > > >
> > >
> >
>

7830. Re: VGA noise filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-13 14:28:25 UTC
From: Sam
Topic: 7820 Message: 7830

I was forgetting that the noise filter is a single filter, which would make substitution even simpler.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> That looks good and should work fine. There is probably no need for further adjustment, but another way to adjust the ceramic filters is simply to replace one or both ceramics. They are cheap, and the tolerance for their center frequencies is quite large, so you might be able to move the center frequency upwards with a different filter.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> >
> > Sam,
> >
> > Many thanks for the explanation. I was only able to move the response a tiny bit, but enough to help with filters up to about 30kHz. I've posted before and after images.
> >
> > Cheers,
> >
> > davidh
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > David,
> > > I should also point out that for the noise filter the shape of the top is not critical, as long as it is not so ugly as to impose ripple on the narrower RBW filters that fit within its bandwidth. Your noise filter has a reasonably curved peak response. For example, if you use a 7 kHz RBW filter, There will be no signals very far outside the 7 kHz bandwidth, so the response of the noise filter at, say, +/-30 kHz from center is irrelevant as far as shaping the signal image. Within the range that a 7 kHz RBW filter cares about, your noise filter is essentially flat. For a wide RBW filter, like 300 kHz, the curvature of the noise filter peak will slightly round the effective shape of the RBW filter and slightly steepen its skirts.
> > >
> > > The spurs don't matter because the total noise within them will be small, as long as your impedance matching is the normal LC low pass topology, causing the attenuation to gradually increase beyond maybe 15 MHz. That means the vast bulk of noise power is between the -3 dB points. These spurs never show up on screen, because no signals at those frequencies reach the noise filter.
> > >
> > > If you wanted to play with the shape, you could add or remove a bit of capacitance

from the impedance matching and see what happens. I don't think the ceramics are very sensitive to such capacitance changes, so you might have to make large changes to have an effect. (e.g. change by 20 pF rather than 2 pF). The optimum setting might involve an increase on one side and a decrease on the other.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >
> > > > David,
> > > > In the SamW--RBWFilters photo album are photos of various dual ceramic filters, one of which is the one you mention. That shows the response I got. In the Files section, in RBW Filters folder, I just posted specs for Murata Cerafil ceramics. It doesn't have our exact part number, but SFECF10M7CQ00-R0 seems to be similar.
> > > >
> > > > Sam W.
> > > >
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "n6tdt" <dhellis@> wrote:
> > > > >
> > > > > David
> > > > >
> > > > > Try this link, Not sure it is what you want but was the only thing that came up for a search on that part number.
> > > > >
> > > > > http://datasheetz.com/data/Filters/Ceramic/490-1231-6-datasheetz.html
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> > > > > >
> > > > > > Folks,
> > > > > >
> > > > > > Does anyone has access to the data-sheet of the sfecv10m7cq that's been specified for the VGA noise filter?
> > > > > >
> > > > > > I've posted the response of the sample I built in the photo section, but without the data, am in no position to make a about its acceptability.
> > > > > >
> > > > > > Thanks,
> > > > > >
> > > > > > davidh
> > > > > >
> > > > >
> > > >
> > >
> >
>

7831. Amplifilter at 10.111 MHz

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-13 17:19:27 UTC
From: Sam
Topic: 7831 Message: 7831

I swapped out the crystals in my amplifilter to use a set that Jerry matched. I restored the components to match the schematic without trimmers, with the op amp gain increased a bit. I left the 10.7 MHz impedance matching in place, with the original 680 nH inductor.

This particular set is almost perfectly matched, with a spread of 3 Hz. The results are outstanding and are shown here:

<http://groups.yahoo.com/group/spectrumanalyzer/photos/album/271352628/pic/332694597/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>

The bandwidth is 244 Hz! The peak is rounded, ripple-free and just slightly asymmetric, with insertion loss near zero. The passband is only 7 kHz wide at -100 dBc.

This beats the 525 Hz bandwidth with my 10.7 MHz crystals. I don't know if the difference is the smaller spread in these (mine had a 66 Hz spread), or the characteristics of the crystals (mine and Jerry's are a factor of two different in Lm). But the main point is that it appears you can get very good results with the standard schematic with very different sets of crystals.

I'm going to change a crystal or two to increase the spread and see what happens.

Sam W.

7832. Re: Amplifilter at 10.111 MHz

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-13 18:42:35 UTC
From: Sam
Topic: 7831 Message: 7832

Well, this was easier than I expected. I was anticipating doing a lot of experimenting to see how well I could correct problems arising from having a crystal that was not well matched to others in the set. So I replaced one of the crystals in the well-matched set with one that is lower in frequency by 90-125 Hz. I don't know what the spreads were in all of Jerry's and Scotty's sets, but from the ones I know of I would guess that all have spreads less than 50 Hz. So I figured having a crystal off by >90Hz would be an extreme test, and with a 244 Hz bandwidth would cause big problems that would require correction.

However, when I substituted the low-frequency crystal, the bandwidth hardly changed, and all that happened is the peak got skewed a bit to the left side and the insertion loss increased by 1.5 dB. There is still no ripple. Photos are in the same album as the photo of the original, so you can look and compare.

My conclusion is that anyone who got a set of the 10.111 MHz crystals could build an amplifilter that would provide very narrow bandwidth with no or very little tinkering. At this bandwidth, phase drift is likely high, but this bandwidth is most useful for high resolution in the SA (though phase noise will limit the dynamic range in which the narrowness provides a benefit), or for VNA scanning of the skirts of steep filters, where phase is not relevant (or at least precise phase is not).

I would guess that with a bandwidth more like my 525 Hz, you might get by with crystal spreads of 100 Hz with no need to tinker. That makes frequency matching a lot easier.

Anyone using the Expanded Log Detector likely can't use the 10.111 MHz filters, because all RBW filters have to fit within the bandwidth of the noise filter. But you can still get narrow bandwidth with 10.7 MHz crystals. Mine was 525 Hz--maybe crystals with Lm more like Jerry's would be narrower but I'm very happy with what I'm getting.

I was not aware that the 10.111 MHz crystals are SMT, but it was no big deal to bend the leads into the normal configuration (and remove the insulating pad), though they are flat rather than round and just barely fit through the holes in the PCB.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I swapped out the crystals in my amplifilter to use a set that Jerry matched. I restored the components to match the schematic without trimmers, with the op amp gain increased a bit. I left the 10.7 MHz impedance matching in place, with the original 680 nH inductor.
>
> This particular set is almost perfectly matched, with a spread of 3 Hz. The results are outstanding and are shown here:
>
> <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/271352628/pic/332694597/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>
>
> The bandwidth is 244 Hz! The peak is rounded, ripple-free and just slightly asymmetric,

with insertion loss near zero. The passband is only 7 kHz wide at -100 dBc.
>
> This beats the 525 Hz bandwidth with my 10.7 MHz crystals. I don't know if the difference is the smaller spread in these (mine had a 66 Hz spread), or the characteristics of the crystals (mine and Jerry's are a factor of two different in Lm). But the main point is that it appears you can get very good results with the standard schematic with very different sets of crystals.
>
> I'm going to change a crystal or two to increase the spread and see what happens.
>
> Sam W.
>

7833. Re: Amplifilter at 10.111 MHz

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-13 22:46:04 UTC
From: Sam
Topic: 7831 Message: 7833

I added a 330 pF series cap to the low-frequency crystal, and pretty much corrected the response. No image though.

One final test, shown in the photo album. I did a scan with 3 well matched crystals and one that was 275 Hz low, which is a huge deviation for a filter with bandwidth near 250 Hz. The shape became distorted, though not horrible, and the insertion loss increased by 5 dB. All crystals had 10 nF series caps, which are essentially invisible. I reduced the series cap on the low crystal to 200 pF and largely solved the problem, though about 0.3 dB of ripple remained.

So significant frequency deviations are correctable, though not perfectly so.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Well, this was easier than I expected. I was anticipating doing a lot of experimenting to see how well I could correct problems arising from having a crystal that was not well matched to others in the set. So I replaced one of the crystals in the well-matched set with one that is lower in frequency by 90-125 Hz. I don't know what the spreads were in all of Jerry's and Scotty's sets, but from the ones I know of I would guess that all have spreads less than 50 Hz. So I figured having a crystal off by >90Hz would be an extreme test, and with a 244 Hz bandwidth would cause big problems that would require correction.
>
> However, when I substituted the low-frequency crystal, the bandwidth hardly changed, and all that happened is the peak got skewed a bit to the left side and the insertion loss increased by 1.5 dB. There is still no ripple. Photos are in the same album as the photo of the original, so you can look and compare.
>
> My conclusion is that anyone who got a set of the 10.111 MHz crystals could build an amplifilter that would provide very narrow bandwidth with no or very little tinkering. At this bandwidth, phase drift is likely high, but this bandwidth is most useful for high resolution in the SA (though phase noise will limit the dynamic range in which the narrowness provides a benefit), or for VNA scanning of the skirts of steep filters, where phase is not relevant (or at least precise phase is not).
>
> I would guess that with a bandwidth more like my 525 Hz, you might get by with crystal spreads of 100 Hz with no need to tinker. That makes frequency matching a lot easier.
>
> Anyone using the Expanded Log Detector likely can't use the 10.111 MHz filters, because all RBW filters have to fit within the bandwidth of the noise filter. But you can still get narrow bandwidth with 10.7 MHz crystals. Mine was 525 Hz--maybe crystals with Lm more like Jerry's would be narrower but I'm very happy with what I'm getting.
>
> I was not aware that the 10.111 MHz crystals are SMT, but it was no big deal to bend the leads into the normal configuration (and remove the insulating pad), though they are flat

rather than round and just barely fit through the holes in the PCB.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > I swapped out the crystals in my amplifilter to use a set that Jerry matched. I restored the components to match the schematic without trimmers, with the op amp gain increased a bit. I left the 10.7 MHz impedance matching in place, with the original 680 nH inductor.
> >
> > This particular set is almost perfectly matched, with a spread of 3 Hz. The results are outstanding and are shown here:
> >
> > <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/271352628/pic/332694597/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>
> >
> > The bandwidth is 244 Hz! The peak is rounded, ripple-free and just slightly asymmetric, with insertion loss near zero. The passband is only 7 kHz wide at -100 dBc.
> >
> > This beats the 525 Hz bandwidth with my 10.7 MHz crystals. I don't know if the difference is the smaller spread in these (mine had a 66 Hz spread), or the characteristics of the crystals (mine and Jerry's are a factor of two different in Lm). But the main point is that it appears you can get very good results with the standard schematic with very different sets of crystals.
> >
> > I'm going to change a crystal or two to increase the spread and see what happens.
> >
> > Sam W.
> >
>

7834. Re: Amplifilter at 10.111 MHz

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-14 17:49:45 UTC
From: Sam
Topic: 7831 Message: 7834

The photo album SamW--RBW Filters now contains the results of my final tweaks of the amplifilter using 10.111 MHz crystals. I went back to the well-matched crystals, since all the sets that were sent out are quite well matched. (In fact, you only need 4 of the 5 crystals, so you can measure them and toss the outlier if you want to improve the match, though probably not necessary.)

I basically reduced the coupling by increasing the two coupling capacitors, and reduced the value of R1 to 33 ohms. The bandwidth is now 220 Hz and the shape of the peak is very nice. I am confident that most people will get similar results with these component values without additional tweaking, or at most having to adjust the op amp gain. Be sure you use good inductors, with Q>20 at 10 MHz. There are some available in 0805 size.

I think the key to the narrow bandwidth is that these crystals have Lm near 20 mH, compared to the 10 mH of my 10.7 MHz crystals. The op amp does not directly contribute to low bandwidth; it just makes it easier to maintain a good shape without needing fine tuning to deal with all the interactions among the crystals.

It occurred to me that the shape of the bottom half of the skirts is probably even narrower than shown in the scans, because I used a 2 kHz RBW filter, which used to seem narrow but is almost 10 times the bandwidth of the amplifilter. But that shouldn't affect the accuracy of the measurement of the amplifilter bandwidth.

I will soon post a new schematic with the final values. I am now going to return to the 10.7 MHz crystals and see what I can do.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I added a 330 pF series cap to the low-frequency crystal, and pretty much corrected the response. No image though.
>
> One final test, shown in the photo album. I did a scan with 3 well matched crystals and one that was 275 Hz low, which is a huge deviation for a filter with bandwidth near 250 Hz. The shape became distorted, though not horrible, and the insertion loss increased by 5 dB. All crystals had 10 nF series caps, which are essentially invisible. I reduced the series cap on the low crystal to 200 pF and largely solved the problem, though about 0.3 dB of ripple remained.
>
> So significant frequency deviations are correctable, though not perfectly so.
>
> Sam W.
>

7835. Amplifilter at 10.7 MHz

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-14 19:18:01 UTC
From: Sam
Topic: 7835 Message: 7835

After I put in the missing impedance match component, my bandwidth with the 10.7 MHz filter became 590 Hz, which is a bit of an increase. The impedance match is almost meaningless, as it matches 50->65 ohms and is mainly intended as a low pass filter, so I could tinker with it, but I'm going to stick with 590 Hz. Which is also nearly what David got with 10.7 MHz crystals from an entirely different source, so I'm pleased with the consistency.

Anyone who wants a narrower bandwidth near 10.7 MHz might have to find crystals with Lm much higher than 10 mH. I tested a 10.73 MHz crystal and got 10 mH. I tested a 10.368 MHz crystal and got 22 mH, but the latter is too far from 10.7 MHz for the Expanded Log Detector. Interestingly, though the crystal with 22 mH was in a short can like Jerry's, as opposed to the much taller can for my 10.7 MHz and the 10.73 MHz crystals, which had 10 mH. I associate the shorter cans with computer clock crystals. Perhaps that style is intentionally made with higher Lm. It would be worth finding some crystals near 10.7 MHz in the short can to see how they measure.

Sam W.

7837. VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-15 01:14:56 UTC
From: davidhooau
Topic: 7837 Message: 7837

Hi folks (I really mean Sam),

Sam's fine paper on his expanded log detector uses a VGA K1 value of 65dB, which implies 15dB gain when VDBS is >1.5V.

My VGA measures about well below this, and I'm puzzled where the 15dB figure comes from. I figure it should be, using very approximate figures:

> +12dB from input transformer.
> -6dB from output transformer.
> 0dB from AGC section.
> +7.6dB from VMAG scaling
> -4.8dB from output section (150ohm source into 200ohm load)
> Transformer losses and loss into R1

What am I missing (apart from the plot)?

Thanks,

davidh

7838. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-15 11:37:21 UTC
From: Sam
Topic: 7837 Message: 7838

David,
It would take me a while to get back into that mathematics, and the current VGA is a bit different from the original. I believe the current VGA is slightly different yet. The original paper was done in 2008, and updated in 2010. It is possible that I didn't update the values in the formula to match the new schematic. My main purpose in the math was simply to show that the overall combination maintains a log detector response.

VDBS would be near 1.5V at max input, which will be something in the 0-5 dBm range, so we don't want much gain, if any. Your list of gains/losses seems correct except I think since you count -4.8 dB for the 150 ohm source into 200 ohm load, you need to add +6 dB because the reference for calculating gain would be 50 ohms into 50 ohms, which would have 6 dB loss.

Gain for high level signals is actually less important than the point at which the VGA output saturates (with VDBS at 1.5V). Gain is more important for low level signals, and the thing to test there, rather than the amount of gain, is the level at which the response diminishes due to noise. It would be best to do that test with the noise filter in place. In operation, VDBS will never fall below about 0.4 V, so you could test low level signals with VDBS set there. The response should start curving due to noise at about -105 or -110 dBm, depending what noise filter you use.

But it is best to do testing of dynamic range with the entire unit (VGA+Filter+Log Detector) assembled. If your VGA is basically functional, and gets approximately a 50 dB gain variation over the range of the control voltage, I suggest building the remaining items and then testing them as a group. Test them by providing an input from -120 dBm to 5 dBm and plotting the MagVolts output of the log detector. For high level signals, you can check the VGA output on a scope for saturation, although as long as MagVolts is increasing significantly with increased signal level, you are OK.

I found that I actually got the best response by putting a 4-6 dB attenuator after the noise filter, which has the effect of cranking up the VGA gain a bit.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Hi folks (I really mean Sam),
>
> Sam's fine paper on his expanded log detector uses a VGA K1 value of 65dB, which implies 15dB gain when VDBS is >1.5V.
>
> My VGA measures about well below this, and I'm puzzled where the 15dB figure comes from. I figure it should be, using very approximate figures:
>
> > +12dB from input transformer.
> > -6dB from output transformer.

> > 0dB from AGC section.
> > +7.6dB from VMAG scaling
> > -4.8dB from output section (150ohm source into 200ohm load)
> > Transformer losses and loss into R1
>
> What am I missing (apart from the plot)?
>
> Thanks,
>
> davidh
>

7839. PLO1&3 issues (still)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-15 15:56:57 UTC
From: William Dillon
Topic: 7839 Message: 7839

Hi everyone,

It's been a while since I've posted. I was stuck last time with my PLO1 & PLO3 failing. I had assumed at that point that it was likely a control issue. I re-built all of my digital control wiring, taking extra care with respect to signal integrity. Now, I can verify that the digital signals are very clean. Also, using my logic analyzer, I captured signals for PLO3 and deciphered them using the lmx2326 datasheet. Again, everything seems very logical. While I was poking around with the frequency counter, I noticed that there was a very weak signal at the Fin pin on the PLL chip. It was so weak, in fact, that the counter didn't really even register it. I looked back through the message archives, and came across the conversation with Santosh in november of last year, specifically:

"The 5dBm output from the VCO goes through
* a 14dBm splitter
* the ERA33 which as a gain ranging between 19.08dBm to 17.13dBm in the 1000MHz to 2100MHz freq range (refer to spec data at 40mA and 85C)
* the 2.5dBm attenuator
So the PLO1 output will be 5 - 14 + 18 - 2.5 = 6.5dBm"

While this doesn't necessarily apply to the discussion of the PLL chip, I realized that between a 5dBm signal out of the VCO, 14dBm splitter, and some misc. loss; I'm right on the edge of the minimum input level for the PLL chip (-10dBm).

I'm wondering if this may be why my PLL chip isn't locking. For reference, I've checked this signal level using what I've constructed of the MSA so far (specifically log-detector and ADC), and compared it to the PLO2 input level. The PLO1 and PLO3 levels are about 4dB down from the PLO2 level. Does this seem like a logical conclusion? Would it be worth my time to fix my VCO's (U5) on each of these devices for better VCO output?

Thanks!
- Will

p.s. There is a small error on your website, Scotty. On the testingslim.html page there is a link to the "Testing the Integrated MSA" which is linked to "file:///C:/My%20Documents/aWebPage/trouble.html" It should probably be "trouble.html".

7840. Re: PLO1&3 issues (still)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-15 17:28:10 UTC
From: Sam
Topic: 7839 Message: 7840

Low power could be the locking problem, but I'm confused about how you are determining the power level with the log detector and ADC. The log detector module is limited to relative low frequencies due to the IC itself and the transformer, so you can't accurately measure 1 GHz signals. You need the peak detector, a power meter or a way to mix the signals down to a frequency you can measure.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> Hi everyone,
>
> It's been a while since I've posted. I was stuck last time with my PLO1 & PLO3 failing. I had assumed at that point that it was likely a control issue. I re-built all of my digital control wiring, taking extra care with respect to signal integrity. Now, I can verify that the digital signals are very clean. Also, using my logic analyzer, I captured signals for PLO3 and deciphered them using the lmx2326 datasheet. Again, everything seems very logical. While I was poking around with the frequency counter, I noticed that there was a very weak signal at the Fin pin on the PLL chip. It was so weak, in fact, that the counter didn't really even register it. I looked back through the message archives, and came across the conversation with Santosh in november of last year, specifically:
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> * the 2.5dBm attenuator
> So the PLO1 output will be 5 - 14 + 18 - 2.5 = 6.5dBm"
>
> While this doesn't necessarily apply to the discussion of the PLL chip, I realized that between a 5dBm signal out of the VCO, 14dBm splitter, and some misc. loss; I'm right on the edge of the minimum input level for the PLL chip (-10dBm).
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> Thanks!
> - Will
>
> p.s. There is a small error on your website, Scotty. On the testingslim.html page there is a link to the "Testing the Integrated MSA" which is linked to "file:///C:/My%20Documents/aWebPage/trouble.html" It should probably be "trouble.html".

>

7841. Filter Analysis and Ripple

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-15 17:34:08 UTC
From: Sam
Topic: 7841 Message: 7841

In tweaking my amplifilter, I suddenly got a response that showed 2 dB of ripple in Filter Analysis, even though I couldn't see much ripple. It turns out that if you have a bit of ripple on one side of the peak and a bit on the other side, the entire span of what lies between them is considered ripple. So you have to apply some common sense to the ripple measurement.

Ripple can be precisely defined when you are dealing with mathematical formulas for filter response, but if you are looking at an arbitrarily wiggly response, it is hard to come up with an algorithm that always does what you want. The algorithm used by Filter Analysis is geared toward ripple on relatively flat peaks, with no additional ripple down the sides.

Sam W.

7842. Re: [spectrumanalyzer] PLO1&3 issues (still)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-15 17:49:09 UTC
From: William Dillon
Topic: 7839 Message: 7842

As a first-cut, I'm using the signal meter on my frequency counter, though that doesn't tell me anything about dBs. I had been using a difference in reading from one to the other, though I realize now that the log detector is much more likely to register a higher value for 1024 Mhz that it would for 2200 Mhz. I think I have the parts to make the peak detector, and meant to build it, but haven't yet. Maybe I'll do that now. Did you do the optional modification to raise the voltage for the VCO to 6 volts? Is that something that's a good idea anyway?

- Will

On Mar 15, 2011, at 10:28 AM, Sam wrote:

> Low power could be the locking problem, but I'm confused about how you are determining the power level with the log detector and ADC. The log detector module is limited to relative low frequencies due to the IC itself and the transformer, so you can't accurately measure 1 GHz signals. You need the peak detector, a power meter or a way to mix the signals down to a frequency you can measure.
>
> Sam W.
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> --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
> >
> > Hi everyone,
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> > So the PLO1 output will be 5 - 14 + 18 - 2.5 = 6.5dBm"
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> > While this doesn't necessarily apply to the discussion of the PLL chip, I realized that between a 5dBm signal out of the VCO, 14dBm splitter, and some misc. loss; I'm right on the edge of the minimum input level for the PLL chip (-10dBm).
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this signal level using what I've constructed of the MSA so far (specifically log-detector and ADC), and compared it to the PLO2 input level. The PLO1 and PLO3 levels are about 4dB down from the PLO2 level. Does this seem like a logical conclusion? Would it be worth my time to fix my VCO's (U5) on each of these devices for better VCO output?
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7843. Re: [spectrumanalyzer] PLO1&3 issues (still)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-15 18:35:05 UTC
From: SFC
Topic: 7839 Message: 7843

Hi,

The vco of PLO2 has a higher output, 8dbm, compared to the vco of PLO1&3 so it's normal that the levels are different. I'm using a zcomm vco thats even lower in power and have no locking problem. But If you think that the level is too low for the pll why not lower the attenuation of the 14db splitter?

Simon

I'm wondering if this may be why my PLL chip isn't locking. For reference, I've checked this signal level using what I've constructed of the MSA so far (specifically log-detector and ADC), and compared it to the PLO2 input level. The PLO1 and PLO3 levels are about 4dB down from the PLO2 level. Does this seem like a logical conclusion? Would it be worth my time to fix my VCO's (U5) on each of these devices for better VCO output?

Thanks!
- Will

p.s. There is a small error on your website, Scotty. On the testingslim.html page there is a link to the "Testing the Integrated MSA" which is linked to "file:///C:/My%20Documents/aWebPage/trouble.html" It should probably be "trouble.html".

_____ NOD32 5954 (20110315) Informatie _____

Dit bericht is gecontroleerd door het NOD32 Antivirus Systeem.
http://www.nod32.nl

7844. Re: PLO1&3 issues (still)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-15 20:22:28 UTC
From: Sam
Topic: 7839 Message: 7844

Yes, I raised the supply to +6V. There doesn't seem to be any reason not to.

When you have the peak detector, the most reliable way to measure power is to cable a PLO output to the meter. If necessary, you can use a probe, but there is likely to be some loss in the probe. I used a female SMA connector with very short piece of thin coax sticking out (the coax came with the connector when I bought it on eBay). I got the center conductor sticking out a bit beyond the shield. I could measure points in the PLO by pressing the coax shield against the fencing as ground, and touching the target point with the center conductor. I even measured the VCO output directly by this method, though I'm not sure I'd recommend that. Better to touch a point downstream of an attenuator. You impose an extra 50 ohm load, so the source sees 25 rather than 50, reducing the circuit voltage to 2/3 of its unprobed value, a reduction of 3.5 dB, which you have to add back in. With a bit of experimentation, I decided that the probe itself had another dB of loss, due to the imperfect grounding. Of course, if you probe an actual output with no load attached, you don't need to add the 3.5 dB.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> As a first-cut, I'm using the signal meter on my frequency counter, though that doesn't tell me anything about dBs. I had been using a difference in reading from one to the other, though I realize now that the log detector is much more likely to register a higher value for 1024 Mhz that it would for 2200 Mhz. I think I have the parts to make the peak detector, and meant to build it, but haven't yet. Maybe I'll do that now. Did you do the optional modification to raise the voltage for the VCO to 6 volts? Is that something that's a good idea anyway?
>
> - Will
>
> On Mar 15, 2011, at 10:28 AM, Sam wrote:
>
> > Low power could be the locking problem, but I'm confused about how you are determining the power level with the log detector and ADC. The log detector module is limited to relative low frequencies due to the IC itself and the transformer, so you can't accurately measure 1 GHz signals. You need the peak detector, a power meter or a way to mix the signals down to a frequency you can measure.
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> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@> wrote:
> > >
> > > Hi everyone,
> > >
> > > It's been a while since I've posted. I was stuck last time with my PLO1 & PLO3 failing. I had assumed at that point that it was likely a control issue. I re-built all of

my digital control wiring, taking extra care with respect to signal integrity. Now, I can verify that the digital signals are very clean. Also, using my logic analyzer, I captured signals for PLO3 and deciphered them using the lmx2326 datasheet. Again, everything seems very logical. While I was poking around with the frequency counter, I noticed that there was a very weak signal at the Fin pin on the PLL chip. It was so weak, in fact, that the counter didn't really even register it. I looked back through the message archives, and came across the conversation with Santosh in november of last year, specifically:
> > >
> > > "The 5dBm output from the VCO goes through
> > > * a 14dBm splitter
> > > * the ERA33 which as a gain ranging between 19.08dBm to 17.13dBm in the 1000MHz to 2100MHz freq range (refer to spec data at 40mA and 85C)
> > > * the 2.5dBm attenuator
> > > So the PLO1 output will be 5 - 14 + 18 - 2.5 = 6.5dBm"
> > >
> > > While this doesn't necessarily apply to the discussion of the PLL chip, I realized that between a 5dBm signal out of the VCO, 14dBm splitter, and some misc. loss; I'm right on the edge of the minimum input level for the PLL chip (-10dBm).
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7845. Re: [spectrumanalyzer] PLO1&3 issues (still)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-15 20:54:51 UTC
From: William Dillon
Topic: 7839 Message: 7845

Thanks for the responses so far, I have some new items on my list of things to check/try. I have one more thing to bring up before I go off for a while and apply what I've learned, and that is the contents of the control commands to PLO3. I collected these when I had the logic analyzer hooked up. I'm posting it half so that if anything stands out as way off, maybe someone will notice, and half, assuming it's normal, there will be an example of the control words in the archive... These were collected during initial power-on, and the bits are in the order that they should be assuming that the PLOs are MSB-first. The letters and numbers below the binary are the names for the registers from the datasheet, such as c1, c2, f10, etc... The meaning of each command word is according to my interpretation of the datasheet. Make sure you're using a monospace font.

Thanks,
- Will

First command sent:

```
10 11100 1000010000000
cc aaaaa bbbbbbbbbbbbb
12 12345 1234567890123
```

A counter = 00111 = 7
B counter = 100001 = 33

Second command sent:

```
11 0 0 000 0 0 0 0 0 0000 000 0 0
cc f f fff f f f f f ffff fff f f
1 1111 111 1 1
12 1 2 345 6 7 8 9 0 1234 567 8 9
```

Counter reset = 0 - Do not reset counters
Power down = 0 - Normal operation (power on)
FoLD control = 000 - Tri-state on FoLD pin
PD Polarity = 0 - CP Polarity negative
CP Tri-state = 0 - Normal operation
Fastlock enable = 0 - Disabled (not forced)
Fastlock control = 0 - No timeout counter
Timeout counter enable = 0 - Timeout counter disabled
Timeout counter value = 0000 - Timeout 3 PD cycles
Testmodes = 000 - Normal
Powerdown mode = 0 - Asynchronous power down
test mode = 0 - Normal

Third command sent:

```
00 11010000000000 0000 0
cc rrrrrrrrrrrrr tttt p
```

11111
12 12345678901234 1234 1

R counter = 1011 = 11
test mode = 0000 = normal
precision = 0 = 3 reference cycles for lock detection

On Mar 15, 2011, at 1:22 PM, Sam wrote:

> Yes, I raised the supply to +6V. There doesn't seem to be any reason not to.
>
> When you have the peak detector, the most reliable way to measure power is to cable a PLO output to the meter. If necessary, you can use a probe, but there is likely to be some loss in the probe. I used a female SMA connector with very short piece of thin coax sticking out (the coax came with the connector when I bought it on eBay). I got the center conductor sticking out a bit beyond the shield. I could measure points in the PLO by pressing the coax shield against the fencing as ground, and touching the target point with the center conductor. I even measured the VCO output directly by this method, though I'm not sure I'd recommend that. Better to touch a point downstream of an attenuator. You impose an extra 50 ohm load, so the source sees 25 rather than 50, reducing the circuit voltage to 2/3 of its unprobed value, a reduction of 3.5 dB, which you have to add back in. With a bit of experimentation, I decided that the probe itself had another dB of loss, due to the imperfect grounding. Of course, if you probe an actual output with no load attached, you don't need to add the 3.5 dB.
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> Sam W.
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> --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
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> > As a first-cut, I'm using the signal meter on my frequency counter, though that doesn't tell me anything about dBs. I had been using a difference in reading from one to the other, though I realize now that the log detector is much more likely to register a higher value for 1024 Mhz that it would for 2200 Mhz. I think I have the parts to make the peak detector, and meant to build it, but haven't yet. Maybe I'll do that now. Did you do the optional modification to raise the voltage for the VCO to 6 volts? Is that something that's a good idea anyway?
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> > - Will
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> > On Mar 15, 2011, at 10:28 AM, Sam wrote:
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> > > > Hi everyone,
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> > > > * a 14dBm splitter
> > > > * the ERA33 which as a gain ranging between 19.08dBm to 17.13dBm in the 1000MHz to 2100MHz freq range (refer to spec data at 40mA and 85C)
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> > > > So the PLO1 output will be 5 - 14 + 18 - 2.5 = 6.5dBm"
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> > > > While this doesn't necessarily apply to the discussion of the PLL chip, I realized that between a 5dBm signal out of the VCO, 14dBm splitter, and some misc. loss; I'm right on the edge of the minimum input level for the PLL chip (-10dBm).
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> > > >
> > >
> > >
> >
>
>

7846. Re: [spectrumanalyzer] PLO1&3 issues (still)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-15 21:45:34 UTC
From: william sprowls
Topic: 7839 Message: 7846

Hi William,
I went back in history to find out what your original problem was, but I can locate the posts. So let's start fresh.
I noticed at one time your Master Oscillator had possible incorrect resistors at R1 and R2. I couldn't read R3. Tell me these are all correct as 33R0 (33 ohm).

The bits below say that the PLO has counters as follows:
Acounter=7
Bcounter=33
The frequency commanded would be (10.7/11)x[(32x33)+7] = 1034 MHz, approximately. For PLO 3, this would be correct.

If you are using testingslim.html page, tell me where the first failure takes place in the procedure.

Although the Log Detector has a cut-off frequency around 160 MHz, it will still measure some power at 1034 Mhz. It will be quite low, but if you compare PLO1 or PLO3 to PLO2, you should get relative readings. PLO2 will probably measure abut 4 dB higher than the other two.

By the way, every time you click "Restart", all of the modules will get re-commanded, just as if you were starting the MSA software from the beginning.
Scotty

--- On Tue, 3/15/11, William Dillon <hpux735@...> wrote:

> From: William Dillon <hpux735@...>
> Subject: Re: [spectrumanalyzer] PLO1&3 issues (still)
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, March 15, 2011, 3:54 PM
> Thanks for the responses so far, I
> have some new items on my list of things to check/try.
> I have one more thing to bring up before I go off for a
> while and apply what I've learned, and that is the contents
> of the control commands to PLO3. I collected these
> when I had the logic analyzer hooked up. I'm posting
> it half so that if anything stands out as way off, maybe
> someone will notice, and half, assuming it's normal, there
> will be an example of the control words in the
> archive... These were collected during initial
> power-on, and the bits are in the order that they should be
> assuming that the PLOs are MSB-first. The letters and
> numbers below the binary are the names for the registers
> from the datasheet, such as c1, c2, f10, etc... The
> meaning of each command word is according to my
> interpretation of the datasheet. Make sure you're

```
> using a monospace font.
>
> Thanks,
> - Will
>
> First command sent:
>
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> cc aaaaa bbbbbbbbbbbbb
> 12 12345 1234567890123
>
> A counter =  00111 = 7
> B counter = 100001 = 33
>
> Second command sent:
>
> 11 0 0 000 0 0 0 0 0 0000 000 0 0
> cc f f fff f f f f f ffff fff f f
>
>    1 1111 111 1 1
> 12 1 2 345 6 7 8 9 0 1234 567 8 9
>
> Counter reset = 0        - Do
> not reset counters
> Power down = 0
>     - Normal operation (power on)
> FoLD control = 000        -
> Tri-state on FoLD pin
> PD Polarity = 0
>     - CP Polarity negative
> CP Tri-state = 0        -
> Normal operation
> Fastlock enable = 0        -
> Disabled (not forced)
> Fastlock control = 0        -
> No timeout counter
> Timeout counter enable = 0    - Timeout
> counter disabled
> Timeout counter value = 0000    - Timeout 3
> PD cycles
> Testmodes = 000
>     - Normal
> Powerdown mode = 0        -
> Asynchronous power down
> test mode = 0
>     - Normal
>
> Third command sent:
>
> 00 11010000000000 0000 0
```

> cc rrrrrrrrrrrrr tttt p
> 11111
> 12 12345678901234 1234 1
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> R counter = 1011 = 11
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> On Mar 15, 2011, at 1:22 PM, Sam wrote:
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> directly by this method, though I'm not sure I'd recommend
> that. Better to touch a point downstream of an attenuator.
> You impose an extra 50 ohm load, so the source sees 25
> rather than 50, reducing the circuit voltage to 2/3 of its
> unprobed value, a reduction of 3.5 dB, which you have to add
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> probe itself had another dB of loss, due to the imperfect
> grounding. Of course, if you probe an actual output with no
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> > Sam W.
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> much more likely to register a higher value for 1024 Mhz
> that it would for 2200 Mhz. I think I have the parts to make
> the peak detector, and meant to build it, but haven't yet.
> Maybe I'll do that now. Did you do the optional modification
> to raise the voltage for the VCO to 6 volts? Is that
> something that's a good idea anyway?
> > >
> > > - Will

> > >
> > > On Mar 15, 2011, at 10:28 AM, Sam wrote:
> > >
> > > > Low power could be the locking problem, but
> I'm confused about how you are determining the power level
> with the log detector and ADC. The log detector module is
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> assumed at that point that it was likely a control issue. I
> re-built all of my digital control wiring, taking extra care
> with respect to signal integrity. Now, I can verify that the
> digital signals are very clean. Also, using my logic
> analyzer, I captured signals for PLO3 and deciphered them
> using the lmx2326 datasheet. Again, everything seems very
> logical. While I was poking around with the frequency
> counter, I noticed that there was a very weak signal at the
> Fin pin on the PLL chip. It was so weak, in fact, that the
> counter didn't really even register it. I looked back
> through the message archives, and came across the
> conversation with Santosh in november of last year,
> specifically:
> > > > >
> > > > > "The 5dBm output from the VCO goes
> through
> > > > > * a 14dBm splitter
> > > > > * the ERA33 which as a gain ranging
> between 19.08dBm to 17.13dBm in the 1000MHz to 2100MHz freq
> range (refer to spec data at 40mA and 85C)
> > > > > * the 2.5dBm attenuator
> > > > > So the PLO1 output will be 5 - 14 + 18
> - 2.5 = 6.5dBm"
> > > > >
> > > > > While this doesn't necessarily apply to
> the discussion of the PLL chip, I realized that between a
> 5dBm signal out of the VCO, 14dBm splitter, and some misc.
> loss; I'm right on the edge of the minimum input level for
> the PLL chip (-10dBm).
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> > > > > I'm wondering if this may be why my PLL
> chip isn't locking. For reference, I've checked this signal
> level using what I've constructed of the MSA so far
> (specifically log-detector and ADC), and compared it to the
> PLO2 input level. The PLO1 and PLO3 levels are about 4dB
> down from the PLO2 level. Does this seem like a logical
> conclusion? Would it be worth my time to fix my VCO's (U5)
> on each of these devices for better VCO output?
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> > > > > Thanks!
> > > > > - Will
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> > > > > p.s. There is a small error on your
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> ---
>
> Yahoo! Groups Links
>
>
> spectrumanalyzer-fullfeatured@yahoogroups.com
>
>
>

7847. Re: PLO1&3 issues (still)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-15 21:53:50 UTC
From: Sam
Topic: 7839 Message: 7847

Good point. The ROS-1500 data sheet shows +8 dBm as the general spec but the table shows almost +10 dBm at the low frequencies, so it could even be 5 dB higher than PLO1 and PLO3. If PLO1 and 3 are roughly equal and PLO2 is roughly 5 dB higher, it seems very likely that they all are at the proper level.

If you still suspect low power you could temporarily make R7=150 ohms to boost the feedback power and see if that causes locking.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "SFC" <sf-cillari@...> wrote:
>
>
> Hi,
>
> The vco of PLO2 has a higher output, 8dbm, compared to the vco of PLO1&3 so it's normal that the levels are different. I'm using a zcomm vco thats even lower in power and have no locking problem. But If you think that the level is too low for the pll why not lower the attenuation of the 14db splitter?
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> Simon
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>
> _____ NOD32 5954 (20110315) Informatie _____
>
> Dit bericht is gecontroleerd door het NOD32 Antivirus Systeem.
> http://www.nod32.nl
>

7848. Re: [spectrumanalyzer] PLO1&3 issues (still)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-15 22:12:09 UTC
From: William Dillon
Topic: 7839 Message: 7848

Hi Scotty,

That's correct, my resistors on the MO were 330 ohm. I changed them some time after the photo was taken, and now I have strong, clean signals on every oscillator connection (including on the input pins the the DDS ICs themselves).

Also, the squared 10.7 Mhz signal out of the DDS is very nice and strong.

I have been looking over the datasheet carefully for the last hour or so, and I agree that the control words look nice.

The first failure is a little hard to estimate, because most of the supply voltages are a little out of spec, but nothing that concerns me too much.
However, I expect the first real failure, and subsequent failures are:

Bias voltage: 2.51 (within spec, but for reference below)
Loop balance voltage: 2.39 (far from equal to bias voltage)
VCO Control voltage: 23.1

I should mention that I have the higher-voltage option in the +20 supply, which is reason for the +23v at the VCO control pin.

I've observed exactly that, PLO2 is about +4 relative to PLO1 and 3. Exactly as expected, now that I know it's supposed to be.

I'm happy now that I can verify clean and correct digital signaling to the PLO modules, as that was a stumbling block for me last time.
Also, I still have the email from you before about changing a line of code in the basic source to enable R and N divider output. I'll try that when I get home.

On Mar 15, 2011, at 2:45 PM, william sprowls wrote:

> Hi William,
> I went back in history to find out what your original problem was, but I can locate the posts. So let's start fresh.
> I noticed at one time your Master Oscillator had possible incorrect resistors at R1 and R2. I couldn't read R3. Tell me these are all correct as 33R0 (33 ohm).
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> The bits below say that the PLO has counters as follows:
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> > Subject: Re: [spectrumanalyzer] PLO1&3 issues (still)
> > To: spectrumanalyzer@yahoogroups.com
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> > meaning of each command word is according to my
> > interpretation of the datasheet. Make sure you're
> > using a monospace font.
> >
> > Thanks,
> > - Will
> >
> > First command sent:
> >
> > 10 11100 1000010000000
> > cc aaaaa bbbbbbbbbbbbb
> > 12 12345 1234567890123
> >
> > A counter = 00111 = 7
> > B counter = 100001 = 33
> >
> > Second command sent:
> >
> > 11 0 0 000 0 0 0 0 0 0000 000 0 0
> > cc f f fff f f f f f ffff fff f f
> >

> > 1 1111 111 1 1
> > 12 1 2 345 6 7 8 9 0 1234 567 8 9
> >
> > Counter reset = 0 - Do
> > not reset counters
> > Power down = 0
> > - Normal operation (power on)
> > FoLD control = 000 -
> > Tri-state on FoLD pin
> > PD Polarity = 0
> > - CP Polarity negative
> > CP Tri-state = 0 -
> > Normal operation
> > Fastlock enable = 0 -
> > Disabled (not forced)
> > Fastlock control = 0 -
> > No timeout counter
> > Timeout counter enable = 0 - Timeout
> > counter disabled
> > Timeout counter value = 0000 - Timeout 3
> > PD cycles
> > Testmodes = 000
> > - Normal
> > Powerdown mode = 0 -
> > Asynchronous power down
> > test mode = 0
> > - Normal
> >
> > Third command sent:
> >
> > 00 11010000000000 0000 0
> > cc rrrrrrrrrrrrr tttt p
> > 11111
> > 12 12345678901234 1234 1
> >
> > R counter = 1011 = 11
> > test mode = 0000 = normal
> > precision = 0 = 3 reference cycles for lock detection
> >
> > On Mar 15, 2011, at 1:22 PM, Sam wrote:
> >
> > > Yes, I raised the supply to +6V. There doesn't seem to
> > be any reason not to.
> > >
> > > When you have the peak detector, the most reliable way
> > to measure power is to cable a PLO output to the meter. If
> > necessary, you can use a probe, but there is likely to be
> > some loss in the probe. I used a female SMA connector with
> > very short piece of thin coax sticking out (the coax came
> > with the connector when I bought it on eBay). I got the

> > center conductor sticking out a bit beyond the shield. I
> > could measure points in the PLO by pressing the coax shield
> > against the fencing as ground, and touching the target point
> > with the center conductor. I even measured the VCO output
> > directly by this method, though I'm not sure I'd recommend
> > that. Better to touch a point downstream of an attenuator.
> > You impose an extra 50 ohm load, so the source sees 25
> > rather than 50, reducing the circuit voltage to 2/3 of its
> > unprobed value, a reduction of 3.5 dB, which you have to add
> > back in. With a bit of experimentation, I decided that the
> > probe itself had another dB of loss, due to the imperfect
> > grounding. Of course, if you probe an actual output with no
> > load attached, you don't need to add the 3.5 dB.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com,
> > William Dillon <hpux735@...> wrote:
> > > >
> > > > As a first-cut, I'm using the signal meter on my
> > frequency counter, though that doesn't tell me anything
> > about dBs. I had been using a difference in reading from one
> > to the other, though I realize now that the log detector is
> > much more likely to register a higher value for 1024 Mhz
> > that it would for 2200 Mhz. I think I have the parts to make
> > the peak detector, and meant to build it, but haven't yet.
> > Maybe I'll do that now. Did you do the optional modification
> > to raise the voltage for the VCO to 6 volts? Is that
> > something that's a good idea anyway?
> > > >
> > > > - Will
> > > >
> > > > On Mar 15, 2011, at 10:28 AM, Sam wrote:
> > > >
> > > > > Low power could be the locking problem, but
> > I'm confused about how you are determining the power level
> > with the log detector and ADC. The log detector module is
> > limited to relative low frequencies due to the IC itself and
> > the transformer, so you can't accurately measure 1 GHz
> > signals. You need the peak detector, a power meter or a way
> > to mix the signals down to a frequency you can measure.
> > > > > >
> > > > > > Sam W.
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com,
> > William Dillon <hpux735@> wrote:
> > > > > > >
> > > > > > > Hi everyone,
> > > > > > >
> > > > > > > It's been a while since I've posted. I

> > was stuck last time with my PLO1 & PLO3 failing. I had
> > assumed at that point that it was likely a control issue. I
> > re-built all of my digital control wiring, taking extra care
> > with respect to signal integrity. Now, I can verify that the
> > digital signals are very clean. Also, using my logic
> > analyzer, I captured signals for PLO3 and deciphered them
> > using the lmx2326 datasheet. Again, everything seems very
> > logical. While I was poking around with the frequency
> > counter, I noticed that there was a very weak signal at the
> > Fin pin on the PLL chip. It was so weak, in fact, that the
> > counter didn't really even register it. I looked back
> > through the message archives, and came across the
> > conversation with Santosh in november of last year,
> > specifically:
> > > > > >
> > > > > > "The 5dBm output from the VCO goes
> > through
> > > > > > * a 14dBm splitter
> > > > > > * the ERA33 which as a gain ranging
> > between 19.08dBm to 17.13dBm in the 1000MHz to 2100MHz freq
> > range (refer to spec data at 40mA and 85C)
> > > > > > * the 2.5dBm attenuator
> > > > > > So the PLO1 output will be 5 - 14 + 18
> > - 2.5 = 6.5dBm"
> > > > > >
> > > > > > While this doesn't necessarily apply to
> > the discussion of the PLL chip, I realized that between a
> > 5dBm signal out of the VCO, 14dBm splitter, and some misc.
> > loss; I'm right on the edge of the minimum input level for
> > the PLL chip (-10dBm).
> > > > > >
> > > > > > I'm wondering if this may be why my PLL
> > chip isn't locking. For reference, I've checked this signal
> > level using what I've constructed of the MSA so far
> > (specifically log-detector and ADC), and compared it to the
> > PLO2 input level. The PLO1 and PLO3 levels are about 4dB
> > down from the PLO2 level. Does this seem like a logical
> > conclusion? Would it be worth my time to fix my VCO's (U5)
> > on each of these devices for better VCO output?
> > > > > >
> > > > > > Thanks!
> > > > > > - Will
> > > > > >
> > > > > > p.s. There is a small error on your
> > website, Scotty. On the testingslim.html page there is a
> > link to the "Testing the Integrated MSA" which is linked to
> > "file:///C:/My%20Documents/aWebPage/trouble.html" It should
> > probably be "trouble.html".
> > > > > >
> > > > >

> > > > >
> > > >
> > >
> > >
> >
> >
> >
> > ------------------------------------
> >
> > Yahoo! Groups Links
> >
> >
> > spectrumanalyzer-fullfeatured@yahoogroups.com
> >
> >
> >
>
>

7849. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-16 00:43:45 UTC
From: davidhooau
Topic: 7837 Message: 7849

Thanks Sam,

I've posted a graph of my initial results in the photo section (davidh's build). This shows the same dual slope you saw, and I'm pretty happy with this as a starting point. I have yet to put a lid on the LD, so the measurements down low are probably a consequence of this.

I'll adjust the resistive divider as you suggested. I might dispense with the 2k7 on the LD SLIM to maximise the signal into the ADC unless you consider the additional filtering it provides with C13 to be important.

One more question please. Why did you use a 4-1 (Z) transformer at the AGC output instead of a 3-1?

Cheerio,

davidh

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> David,
> It would take me a while to get back into that mathematics, and the current VGA is a bit different from the original. I believe the current VGA is slightly different yet. The original paper was done in 2008, and updated in 2010. It is possible that I didn't update the values in the formula to match the new schematic. My main purpose in the math was simply to show that the overall combination maintains a log detector response.
>
> VDBS would be near 1.5V at max input, which will be something in the 0-5 dBm range, so we don't want much gain, if any. Your list of gains/losses seems correct except I think since you count -4.8 dB for the 150 ohm source into 200 ohm load, you need to add +6 dB because the reference for calculating gain would be 50 ohms into 50 ohms, which would have 6 dB loss.
>
> Gain for high level signals is actually less important than the point at which the VGA output saturates (with VDBS at 1.5V). Gain is more important for low level signals, and the thing to test there, rather than the amount of gain, is the level at which the response diminishes due to noise. It would be best to do that test with the noise filter in place. In operation, VDBS will never fall below about 0.4 V, so you could test low level signals with VDBS set there. The response should start curving due to noise at about -105 or -110 dBm, depending what noise filter you use.
>
> But it is best to do testing of dynamic range with the entire unit (VGA+Filter+Log Detector) assembled. If your VGA is basically functional, and gets approximately a 50 dB gain variation over the range of the control voltage, I suggest building the remaining items and then testing them as a group. Test them by providing an input from -120 dBm to 5 dBm and plotting the MagVolts output of the log detector. For high level signals, you can check the VGA output on a scope for saturation, although as long as MagVolts is increasing

significantly with increased signal level, you are OK.
>
> I found that I actually got the best response by putting a 4-6 dB attenuator after the noise filter, which has the effect of cranking up the VGA gain a bit.
>
> Sam W.
>
>
>
> --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> >
> > Hi folks (I really mean Sam),
> >
> > Sam's fine paper on his expanded log detector uses a VGA K1 value of 65dB, which implies 15dB gain when VDBS is >1.5V.
> >
> > My VGA measures about well below this, and I'm puzzled where the 15dB figure comes from. I figure it should be, using very approximate figures:
> >
> > > +12dB from input transformer.
> > > -6dB from output transformer.
> > > 0dB from AGC section.
> > > +7.6dB from VMAG scaling
> > > -4.8dB from output section (150ohm source into 200ohm load)
> > > Transformer losses and loss into R1
> >
> > What am I missing (apart from the plot)?
> >
> > Thanks,
> >
> > davidh
> >
>

7850. RBW Switch PCB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-16 01:53:59 UTC
From: davidhooau
Topic: 7850 Message: 7850

Folks,

Does any kind soul out there have a 2P4T filter switch PCB I could purchase? It's the last bit I need to finish my SSA, and is probably beyond my home brew PCB making skills.

Thanks,

davidh

7851. YIG PO-2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-16 11:22:49 UTC
From: jghbeta
Topic: 7851 Message: 7851

Hi Scotty,
I am working on a YIG for PLO2. The Yig outputs 15 dBm and it is followed by a 15 dBm attenuator to limit the input to the divide by 8 prescaler (a Hittite HMC363S8G) to 0 dBm. The prescaler output (1024 MHz) is - 6 dBm. This is going to be split to go to Mxr 2 and Mxr 3. The YIG PLL feed back is taken care off at the YIG output so the splitter here is just a two way 6 dBm. This means that at the input of the MMIC amps I have -12 dBm (-6 from the prescaler output plus -6 from the splitter attenuation). Here is were I am stuck: I need +10 dBm at the mixers (an amplifier gain of 22 dBm). Any suggestions? Obviously I am concerned with introducing amplifier noise and nullifying the YIG advantage.

Jim W1JGH

7852. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-16 14:25:51 UTC
From: Sam
Topic: 7837 Message: 7852

David,
Don't delete that 2.7k resistor. It is critical for filtering, and also has some effect on the feedback ratio to the VGA. Speaking of which, there were several iterations of the VGA; the final one has a 10k and 27k voltage divider in the VDBS line. Does yours have that?

The 1:4 transformer was originally a mistake; I had it in my mind that the AD8330 output impedance was 180 ohms, whereas it is 150 ohms. But the 1:4 makes the voltage to the log detector a bit lower, which is a slightly good thing. It causes the log detector to increase the gain of the VGA, putting it in a range where its internal noise performance is a bit better. This same principle is why adding a 6 dB attenuator after the noise filter improves performance a bit.

Your graph flattens out at the low end almost 10 dB higher than I expected. As you say, this may have to do with lack of shielding, which might cause some low level interference. I found that my log detector had a small bump in its noise output, which went away when I put a 22 pF cap across the AD8306 output (it fits nicely across the output resistors.) So the bump was actually a feedback problem. This may have to do with the fact that I decreased R6 to 75 ohms to increase the RF output level.

But your graph also extends nicely to 10 dBm, which makes me wonder whether the whole thing isn't shifted to the right, perhaps due to the possibly low gain issue you mentioned. Maybe there is a problem with the input transformer (under-transforming). I would also check the VDBS voltage at the IC pin to see if the voltage divider is working correctly. Finally, be sure VMAG is correct.

You can actually utilize the response up to 10 dBm if you use Scotty's IF2 amp, but one of my objectives was to reduce the max power put through the filters, so it would be nice if the response could be shifted left to cover the same range but at lower power levels.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Thanks Sam,
>
> I've posted a graph of my initial results in the photo section (davidh's build). This shows the same dual slope you saw, and I'm pretty happy with this as a starting point. I have yet to put a lid on the LD, so the measurements down low are probably a consequence of this.
>
> I'll adjust the resistive divider as you suggested. I might dispense with the 2k7 on the LD SLIM to maximise the signal into the ADC unless you consider the additional filtering it provides with C13 to be important.
>
> One more question please. Why did you use a 4-1 (Z) transformer at the AGC output instead of a 3-1?

>
> Cheerio,
>
> davidh
>
>
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > David,
> > It would take me a while to get back into that mathematics, and the current VGA is a bit different from the original. I believe the current VGA is slightly different yet. The original paper was done in 2008, and updated in 2010. It is possible that I didn't update the values in the formula to match the new schematic. My main purpose in the math was simply to show that the overall combination maintains a log detector response.
> >
> > VDBS would be near 1.5V at max input, which will be something in the 0-5 dBm range, so we don't want much gain, if any. Your list of gains/losses seems correct except I think since you count -4.8 dB for the 150 ohm source into 200 ohm load, you need to add +6 dB because the reference for calculating gain would be 50 ohms into 50 ohms, which would have 6 dB loss.
> >
> > Gain for high level signals is actually less important than the point at which the VGA output saturates (with VDBS at 1.5V). Gain is more important for low level signals, and the thing to test there, rather than the amount of gain, is the level at which the response diminishes due to noise. It would be best to do that test with the noise filter in place. In operation, VDBS will never fall below about 0.4 V, so you could test low level signals with VDBS set there. The response should start curving due to noise at about -105 or -110 dBm, depending what noise filter you use.
> >
> > But it is best to do testing of dynamic range with the entire unit (VGA+Filter+Log Detector) assembled. If your VGA is basically functional, and gets approximately a 50 dB gain variation over the range of the control voltage, I suggest building the remaining items and then testing them as a group. Test them by providing an input from -120 dBm to 5 dBm and plotting the MagVolts output of the log detector. For high level signals, you can check the VGA output on a scope for saturation, although as long as MagVolts is increasing significantly with increased signal level, you are OK.
> >
> > I found that I actually got the best response by putting a 4-6 dB attenuator after the noise filter, which has the effect of cranking up the VGA gain a bit.
> >
> > Sam W.
> >
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> > >
> > > Hi folks (I really mean Sam),
> > >
> > > Sam's fine paper on his expanded log detector uses a VGA K1 value of 65dB, which

implies 15dB gain when VDBS is >1.5V.
> > >
> > > My VGA measures about well below this, and I'm puzzled where the 15dB figure comes from. I figure it should be, using very approximate figures:
> > >
> > > > +12dB from input transformer.
> > > > -6dB from output transformer.
> > > > 0dB from AGC section.
> > > > +7.6dB from VMAG scaling
> > > > -4.8dB from output section (150ohm source into 200ohm load)
> > > > Transformer losses and loss into R1
> > >
> > > What am I missing (apart from the plot)?
> > >
> > > Thanks,
> > >
> > > davidh
> > >
> >
>

7853. Re: YIG PO-2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-16 16:36:38 UTC
From: Sam
Topic: 7851 Message: 7853

Jim,
As long as you are going the fancy route with the YIG, here is a modestly spendy solution. You need isolation between the two branches of LO2, which is one purpose of the original amps. The isolation comes from the attenuation in the amp plus the reverse isolation of the MMIC. If you run two separate dividers with two separate attenuators from your YIG, you'll get a good start on isolation--at least as much as comes from the splitter off the original VCO. The phases out of the two dividers won't be the same, but due to differing line lengths the two LO2 branches are never the same phase anyway; the important thing is that they maintain whatever phase relationship they have. (Having two dividers is really no different than having PLO1 and PLO3 run by different DDSs.)

Next, an isolator on each line, such as:
http://cgi.ebay.com/Teledyne-C-1S13T-3-Circulator-950-1150MHz-<20dB-Isolat-/300429680576?pt=LH_DefaultDomain_0&hash=item45f3011fc0>

You could even put the isolators before the dividers, where a small amount of loss is irrelevant.

If you don't like the two-divider idea, then use two isolators on each line, or maybe only on the line leading to mixer 3--the extra isolator would replace the buffer amp.

Maybe the dividers themselves actually have a good amount of isolation, in which case the isolators might not be critical. That would be easy to check once you get the dividers hooked up.

Then you need an amp on each line, such as ABA-52563, to get up to LO level.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> Hi Scotty,
> I am working on a YIG for PLO2. The Yig outputs 15 dBm and it is followed by a 15 dBm attenuator to limit the input to the divide by 8 prescaler (a Hittite HMC363S8G) to 0 dBm. The prescaler output (1024 MHz) is - 6 dBm. This is going to be split to go to Mxr 2 and Mxr 3. The YIG PLL feed back is taken care off at the YIG output so the splitter here is just a two way 6 dBm. This means that at the input of the MMIC amps I have -12 dBm (-6 from the prescaler output plus -6 from the splitter attenuation). Here is were I am stuck: I need +10 dBm at the mixers (an amplifier gain of 22 dBm). Any suggestions? Obviously I am concerned with introducing amplifier noise and nullifying the YIG advantage.
>
> Jim W1JGH
>

7854. Re: YIG PO-2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-16 16:50:25 UTC
From: Sam
Topic: 7851 Message: 7854

Caveat: The isolator idea assumes that the prime concern with isolation is in the 1013-1150 MHz range. In that range an isolator might provide 20-40 dB of isolation. For LO1 or LO3 above that trying to leak back to the YIG, the isolator would probably provide attenuation of only 10 dB or so. Maybe add a low-pass filter like LFCN-900?

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Jim,
> As long as you are going the fancy route with the YIG, here is a modestly spendy solution. You need isolation between the two branches of LO2, which is one purpose of the original amps. The isolation comes from the attenuation in the amp plus the reverse isolation of the MMIC. If you run two separate dividers with two separate attenuators from your YIG, you'll get a good start on isolation--at least as much as comes from the splitter off the original VCO. The phases out of the two dividers won't be the same, but due to differing line lengths the two LO2 branches are never the same phase anyway; the important thing is that they maintain whatever phase relationship they have. (Having two dividers is really no different than having PLO1 and PLO3 run by different DDSs.)
>
> Next, an isolator on each line, such as:
> http://cgi.ebay.com/Teledyne-C-1S13T-3-Circulator-950-1150MHz-<20dB-Isolat-/300429680576?pt=LH_DefaultDomain_0&hash=item45f3011fc0>
>
> You could even put the isolators before the dividers, where a small amount of loss is irrelevant.
>
> If you don't like the two-divider idea, then use two isolators on each line, or maybe only on the line leading to mixer 3--the extra isolator would replace the buffer amp.
>
> Maybe the dividers themselves actually have a good amount of isolation, in which case the isolators might not be critical. That would be easy to check once you get the dividers hooked up.
>
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> Sam W.
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> --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
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just a two way 6 dBm. This means that at the input of the MMIC amps I have -12 dBm (-6 from the prescaler output plus -6 from the splitter attenuation). Here is were I am stuck: I need +10 dBm at the mixers (an amplifier gain of 22 dBm). Any suggestions? Obviously I am concerned with introducing amplifier noise and nullifying the YIG advantage.
> >
> > Jim W1JGH
> >
>

7855. Re: [spectrumanalyzer] RBW Switch PCB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-16 18:15:03 UTC
From: Robert Fish
Topic: 7850 Message: 7855

Hi David,

I still have those in stock. They are $5.00 plus $1.00 shipping. Paypal is the best payment method for me.
My Paypal account number is my e-mail address: rwfish@...

Thanks,

Bob
>
> Folks,
>
> Does any kind soul out there have a 2P4T filter switch PCB I could
> purchase? It's the last bit I need to finish my SSA, and is probably
> beyond my home brew PCB making skills.
>
> Thanks,
>
> davidh
>
>

7856. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-16 20:21:57 UTC
From: davidhooau
Topic: 7837 Message: 7856

Sam,

Wilco on the 2k7, and yes, I have 10k/27k giving an overall P of 0.68.

May I again check the VGA levels with you?

Looking only at voltage levels, with VDBS > 1.5V:

> input xfmr: Av=4
> loss due to 3k9: Av=0.8
> VGA: Av=1
> Vmag: Av=2.4
> output resistors: Av=0.57
> output transformer: Av=0.5

This gives me an overall gain (50R to 50R) of 2.188 or 6.8dB, which is exactly what I've measured.

What am I missing?

Thanks,

davidh

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> David,
> Don't delete that 2.7k resistor. It is critical for filtering, and also has some effect on the feedback ratio to the VGA. Speaking of which, there were several iterations of the VGA; the final one has a 10k and 27k voltage divider in the VDBS line. Does yours have that?
>
> The 1:4 transformer was originally a mistake; I had it in my mind that the AD8330 output impedance was 180 ohms, whereas it is 150 ohms. But the 1:4 makes the voltage to the log detector a bit lower, which is a slightly good thing. It causes the log detector to increase the gain of the VGA, putting it in a range where its internal noise performance is a bit better. This same principle is why adding a 6 dB attenuator after the noise filter improves performance a bit.
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> Your graph flattens out at the low end almost 10 dB higher than I expected. As you say, this may have to do with lack of shielding, which might cause some low level interference. I found that my log detector had a small bump in its noise output, which went away when I put a 22 pF cap across the AD8306 output (it fits nicely across the output resistors.) So the bump was actually a feedback problem. This may have to do with the fact that I decreased R6 to 75 ohms to increase the RF output level.
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> But your graph also extends nicely to 10 dBm, which makes me wonder whether the whole

thing isn't shifted to the right, perhaps due to the possibly low gain issue you mentioned. Maybe there is a problem with the input transformer (under-transforming). I would also check the VDBS voltage at the IC pin to see if the voltage divider is working correctly. Finally, be sure VMAG is correct.
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> You can actually utilize the response up to 10 dBm if you use Scotty's IF2 amp, but one of my objectives was to reduce the max power put through the filters, so it would be nice if the response could be shifted left to cover the same range but at lower power levels.
>
> Sam W.
>
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> >
> > Thanks Sam,
> >
> > I've posted a graph of my initial results in the photo section (davidh's build). This shows the same dual slope you saw, and I'm pretty happy with this as a starting point. I have yet to put a lid on the LD, so the measurements down low are probably a consequence of this.
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> > I'll adjust the resistive divider as you suggested. I might dispense with the 2k7 on the LD SLIM to maximise the signal into the ADC unless you consider the additional filtering it provides with C13 to be important.
> >
> > One more question please. Why did you use a 4-1 (Z) transformer at the AGC output instead of a 3-1?
> >
> > Cheerio,
> >
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> >
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > David,
> > > It would take me a while to get back into that mathematics, and the current VGA is a bit different from the original. I believe the current VGA is slightly different yet. The original paper was done in 2008, and updated in 2010. It is possible that I didn't update the values in the formula to match the new schematic. My main purpose in the math was simply to show that the overall combination maintains a log detector response.
> > >
> > > VDBS would be near 1.5V at max input, which will be something in the 0-5 dBm range, so we don't want much gain, if any. Your list of gains/losses seems correct except I think since you count -4.8 dB for the 150 ohm source into 200 ohm load, you need to add +6 dB because the reference for calculating gain would be 50 ohms into 50 ohms, which would have 6 dB loss.
> > >
> > > Gain for high level signals is actually less important than the point at which the VGA output saturates (with VDBS at 1.5V). Gain is more important for low level signals, and the thing to test there, rather than the amount of gain, is the level at which the response

diminishes due to noise. It would be best to do that test with the noise filter in place. In operation, VDBS will never fall below about 0.4 V, so you could test low level signals with VDBS set there. The response should start curving due to noise at about -105 or -110 dBm, depending what noise filter you use.
> > >
> > > But it is best to do testing of dynamic range with the entire unit (VGA+Filter+Log Detector) assembled. If your VGA is basically functional, and gets approximately a 50 dB gain variation over the range of the control voltage, I suggest building the remaining items and then testing them as a group. Test them by providing an input from -120 dBm to 5 dBm and plotting the MagVolts output of the log detector. For high level signals, you can check the VGA output on a scope for saturation, although as long as MagVolts is increasing significantly with increased signal level, you are OK.
> > >
> > > I found that I actually got the best response by putting a 4-6 dB attenuator after the noise filter, which has the effect of cranking up the VGA gain a bit.
> > >
> > > Sam W.
> > >
> > >
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> > > >
> > > > Hi folks (I really mean Sam),
> > > >
> > > > Sam's fine paper on his expanded log detector uses a VGA K1 value of 65dB, which implies 15dB gain when VDBS is >1.5V.
> > > >
> > > > My VGA measures about well below this, and I'm puzzled where the 15dB figure comes from. I figure it should be, using very approximate figures:
> > > >
> > > > > +12dB from input transformer.
> > > > > -6dB from output transformer.
> > > > > 0dB from AGC section.
> > > > > +7.6dB from VMAG scaling
> > > > > -4.8dB from output section (150ohm source into 200ohm load)
> > > > > Transformer losses and loss into R1
> > > >
> > > > What am I missing (apart from the plot)?
> > > >
> > > > Thanks,
> > > >
> > > > davidh
> > > >
> > >
> >
>

7857. Re: [spectrumanalyzer] Re: YIG PO-2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-16 22:41:12 UTC
From: Jim Hontoria
Topic: 7851 Message: 7857

Hi Sam,
The prescaler has two outputs at 180 degrees from each other. The only other information that I get from the dta sheet is that the reverse leakage, with both outputs terminated, is 65 dB. I am not on firm ground here, but if as you said, there is always going to be a phase diffrence anyway, I could use these two outputs without need for the splitter. Then I could follow them by a buffer, LNA or whatever to reach MXR2 and MXR3.

Jim

>
>
> Caveat: The isolator idea assumes that the prime concern with isolation is
> in the 1013-1150 MHz range. In that range an isolator might provide 20-40 dB
> of isolation. For LO1 or LO3 above that trying to leak back to the YIG, the
> isolator would probably provide attenuation of only 10 dB or so. Maybe add a
> low-pass filter like LFCN-900?
>
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
> >
> > Jim,
> > As long as you are going the fancy route with the YIG, here is a modestly
> spendy solution. You need isolation between the two branches of LO2, which
> is one purpose of the original amps. The isolation comes from the
> attenuation in the amp plus the reverse isolation of the MMIC. If you run
> two separate dividers with two separate attenuators from your YIG, you'll
> get a good start on isolation--at least as much as comes from the splitter
> off the original VCO. The phases out of the two dividers won't be the same,
> but due to differing line lengths the two LO2 branches are never the same
> phase anyway; the important thing is that they maintain whatever phase
> relationship they have. (Having two dividers is really no different than
> having PLO1 and PLO3 run by different DDSs.)
> >
> > Next, an isolator on each line, such as:
> > http://cgi.ebay.com/Teledyne-C-1S13T-3-Circulator-950-1150MHz-
> <20dB-Isolat-/300429680576?pt=LH_DefaultDomain_0&hash=item45f3011fc0>
> >
> > You could even put the isolators before the dividers, where a small
> amount of loss is irrelevant.
> >
> > If you don't like the two-divider idea, then use two isolators on each
> line, or maybe only on the line leading to mixer 3--the extra isolator would

> replace the buffer amp.
> >
> > Maybe the dividers themselves actually have a good amount of isolation,
> in which case the isolators might not be critical. That would be easy to
> check once you get the dividers hooked up.
> >
> > Then you need an amp on each line, such as ABA-52563, to get up to LO
> level.
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
> > >
> > > Hi Scotty,
> > > I am working on a YIG for PLO2. The Yig outputs 15 dBm and it is
> followed by a 15 dBm attenuator to limit the input to the divide by 8
> prescaler (a Hittite HMC363S8G) to 0 dBm. The prescaler output (1024 MHz) is
> - 6 dBm. This is going to be split to go to Mxr 2 and Mxr 3. The YIG PLL
> feed back is taken care off at the YIG output so the splitter here is just a
> two way 6 dBm. This means that at the input of the MMIC amps I have -12 dBm
> (-6 from the prescaler output plus -6 from the splitter attenuation). Here
> is were I am stuck: I need +10 dBm at the mixers (an amplifier gain of 22
> dBm). Any suggestions? Obviously I am concerned with introducing amplifier
> noise and nullifying the YIG advantage.
> > >
> > > Jim W1JGH
> > >
> >
>
>
>

--
Jim G. Hontoria

7858. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-16 23:44:49 UTC
From: Sam
Topic: 7837 Message: 7858

David,
Your numbers seem correct. What confuses me is how you can get such a good response with inputs up to 10 dBm.

Per p. 16 of the data sheet, with VMag=1.2 and a load of 200 ohms, the max voltage swing at the AD8330 output is +/-1.4V. At the transformer secondary, this would be halved to +/-0.7V. That is 7 dBm. With a gain of 6.8 dB, the AD8330 should start saturating with an input of 0.2 dBm. There would still be increased output with increased input (the output starts to square, but the fundamental content will still increase), but the response should start to flatten at 0.2 dBm input. Your response seems very linear well beyond that.

It seems odd to be worried about the circuit functioning too well at high input levels, but I wonder whether that is connected with the low end not extending as far as it should.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
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> Sam,
>
> Wilco on the 2k7, and yes, I have 10k/27k giving an overall P of 0.68.
>
> May I again check the VGA levels with you?
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> Looking only at voltage levels, with VDBS > 1.5V:
>
> > input xfmr: Av=4
> > loss due to 3k9: Av=0.8
> > VGA: Av=1
> > Vmag: Av=2.4
> > output resistors: Av=0.57
> > output transformer: Av=0.5
>
> This gives me an overall gain (50R to 50R) of 2.188 or 6.8dB, which is exactly what I've measured.
>
> What am I missing?
>
> Thanks,
>
> davidh

7859. Re: YIG PO-2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-16 23:53:57 UTC
From: Sam
Topic: 7851 Message: 7859

I'm surprised that a divider data sheet even mentions reverse leakage. If it is 65 dB, which seems phenomenal, all you would have to do is run each output through an amp (the need for two amps seems unavoidable), which will have some additional reverse isolation, probably 20-30 dB. That should put you in good shape.

It certainly would be possible to construct the YIG+divider and check the reverse isolation. You would input a strong signal to one divider output and look for it in the other divider output. If the divider is outputting 1024 MHz, you could try various frequencies from 1013 to 2013 MHz, but of course you couldn't test at exactly 1024 MHz.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
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> Hi Sam,
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> information that I get from the dta sheet is that the reverse leakage, with
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> you said, there is always going to be a phase diffrence anyway, I could use
> these two outputs without need for the splitter. Then I could follow them
> by a buffer, LNA or whatever to reach MXR2 and MXR3.
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> Jim
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> > Caveat: The isolator idea assumes that the prime concern with isolation is
> > in the 1013-1150 MHz range. In that range an isolator might provide 20-40 dB
> > of isolation. For LO1 or LO3 above that trying to leak back to the YIG, the
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> > low-pass filter like LFCN-900?
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> > Sam W.
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> > > Then you need an amp on each line, such as ABA-52563, to get up to LO
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> > > >
> > > > Jim W1JGH
> > > >
> > >
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>
> --
> Jim G. Hontoria
>

7860. Re: [spectrumanalyzer] Re: YIG PO-2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-17 01:09:04 UTC
From: william sprowls
Topic: 7851 Message: 7860

Hi Jim,
On Sam's comment I went and looked at the Hittite data sheet. The 65 dB isolation spec is from either output back to input, not output A to output B. Since both outputs are separated by only the internal source resistors (probably 50 ohm) the output port to output port is probably less than 20 dB. As Sam suggested, you can test the isolation but here is a good method that is a little easier and still provide good results. Bias the input of the Hittite divider so that it has no input and does not oscillate. Each output will be either at a "0" or "1". No toggling at all. This way there is no RF power applied back into your test equipment. The actual isolation results will probably look a bit better than when the Hittite is dividing normally. But it should be within a few dB.

Even if the isolation is crummy, you can still feed each of those outputs to separate amplifiers, such as the SLIM-RFA-1, to feed Mixers 2 and 3.. Just remove the input attenuators in the SLIM-RFA for full gain.
Scotty

--- On Wed, 3/16/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: YIG PO-2
To: spectrumanalyzer@yahoogroups.com
Date: Wednesday, March 16, 2011, 6:53 PM

I'm surprised that a divider data sheet even mentions reverse leakage. If it is 65 dB, which seems phenomenal, all you would have to do is run each output through an amp (the need for two amps seems unavoidable), which will have some additional reverse isolation, probably 20-30 dB. That should put you in good shape.

It certainly would be possible to construct the YIG+divider and check the reverse isolation. You would input a strong signal to one divider output and look for it in the other divider output. If the divider is outputting 1024 MHz, you could try various frequencies from 1013 to 2013 MHz, but of course you couldn't test at exactly 1024 MHz.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:

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> these two outputs without need for the splitter. Then I could follow them

> by a buffer, LNA or whatever to reach MXR2 and MXR3.

>

> Jim

7861. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-17 02:50:44 UTC
From: davidhooau
Topic: 7837 Message: 7861

Hi Sam,

To use an American expression, I've thrown you a curve ball.

When I plot more samples and look closely at the raw data, I'm only in the "linear" range up until 0dBm input, which is pretty close to VDBS being 1.5V.

At +5dBm I'm reading about 2dB high at the LD output, as the slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB with my AGC/LD combination.

At 10dBm input limiting is taking place, I'm guessing as the AD8330 runs out of puff, and it just happens that this 10dBm sample is approximately in the same line as the data between -40 and 0dBm. If I'd gathered more samples in the first graph, this would have been much clearer. (memo to self...)

I'll adjust VMAG to get the overall AGC gain range correct (15-65dB) and check that my system now functions per your paper.

Many thanks for your help with this.

davidh

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> David,
> Your numbers seem correct. What confuses me is how you can get such a good response with inputs up to 10 dBm.
>
> Per p. 16 of the data sheet, with VMag=1.2 and a load of 200 ohms, the max voltage swing at the AD8330 output is +/-1.4V. At the transformer secondary, this would be halved to +/-0.7V. That is 7 dBm. With a gain of 6.8 dB, the AD8330 should start saturating with an input of 0.2 dBm. There would still be increased output with increased input (the output starts to square, but the fundamental content will still increase), but the response should start to flatten at 0.2 dBm input. Your response seems very linear well beyond that.
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> It seems odd to be worried about the circuit functioning too well at high input levels, but I wonder whether that is connected with the low end not extending as far as it should.
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> Sam W.
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> --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
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> > Sam,
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> > Wilco on the 2k7, and yes, I have 10k/27k giving an overall P of 0.68.
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> > May I again check the VGA levels with you?

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> > Looking only at voltage levels, with VDBS > 1.5V:
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> > > input xfmr: Av=4
> > > loss due to 3k9: Av=0.8
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> > This gives me an overall gain (50R to 50R) of 2.188 or 6.8dB, which is exactly what I've measured.
> >
> > What am I missing?
> >
> > Thanks,
> >
> > davidh
>

7862. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-17 13:49:22 UTC
From: Sam
Topic: 7837 Message: 7862

David,
The only purpose of looking at the high end is to see whether there is some problem with the module that might also affect the low end, and we don't seem to have found any such problem. So maybe the abrupt flattening at the low end is due to the lack of shielding, as you originally suggested.

If you try adjusting VMag, you'll find that your efforts are largely defeated by the feedback loop. For example, lowering VMag lowers the VGA gain, reducing the log amp input and therefore the feedback voltage. The lower feedback voltage increases the VGA gain, partially cancelling the effect of the original lowering of VMag. You get a similar effect if you adjust the feedback ratio.

I suggest that you put the fencing and lid on the log detector, which is where shielding is the most important, and then check the low end response.

I've been assuming you have the noise filter in place. Is it the 500 kHz filter? Perhaps the only difference between your response and that in my paper is the noise filter width. I used 150 kHz. In my MSA I am using 500 kHz. I did not directly test the response of the Expanded Log Detector with that wider filter, but it did not seem to affect the lowest detectable signal level at the MSA input. Possibly the Expanded Log Detector's low end response would be extended with a narrower filter, but that extra range is not reachable with my narrowest RBW filter, which is now 2 kHz. Maybe a narrower noise filter would be useful when I install my 600 kHz amplifilter. If so, I'll have to reconsider using the switchable noise filter, which would allow a wide noise filter for all RBW's except the narrowest one, where a much narrower one would kick in.

As a rough calculation, if you input to the MSA a signal of -115 dBm and have losses of 20 dB by the time you reach the IF2 amp, the signal is -135 dBm at that point, -107 dBm at the output of the 28 dB amp, and perhaps -110 dBm at the output of the RBW filter. At that point the signal will be accompanied by noise from the amp (say, -174 dBm/Hz plus 4 created by the amp plus 28 due to amplification) equal to -142 dBm/Hz. With a 2 kHz RBW filter with 3 dB loss, that is -142+36-3=-109 dBm of noise, accompanying the -110 dBm signal. The signal would still be discernible, but there would any point in the Expanded Log Detector maintaining a strong response below the -109 dBm noise level, which is about where yours (and maybe mine) peters out. A narrower noise filter would therefore not be of much benefit. With a 600 Hz RBW filter, the noise level would be reduced by 5 dB, so a narrower noise filter might increase the low end range by 5 dB. Maybe not worth the effort.

(Note that a detector that dies below -110 dBm can still detect a -112 dBm signal if the signal is accompanied by enough noise to push the total signal+noise over -110 dBm. The noise actually provides some benefit! The detector needs a range that extends down to the noise level, but the actual detectable signal will extend below the detector's nominal range.)

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Hi Sam,
>
> To use an American expression, I've thrown you a curve ball.
>
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> At +5dBm I'm reading about 2dB high at the LD output, as the slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB with my AGC/LD combination.
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> At 10dBm input limiting is taking place, I'm guessing as the AD8330 runs out of puff, and it just happens that this 10dBm sample is approximately in the same line as the data between -40 and 0dBm. If I'd gathered more samples in the first graph, this would have been much clearer. (memo to self...)
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> Many thanks for your help with this.
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> > > What am I missing?
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> > > Thanks,
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> > > davidh
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7863. Re: [spectrumanalyzer] Re: YIG PO-2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-17 14:55:57 UTC
From: william sprowls
Topic: 7851 Message: 7863

Hi Jim (and others who are following Jim's YTO plan),
  I thought I would add an addition to my comment about adding amplifiers. If you have room on your Hittite divider board, you could add the amplifiers there. For example, if each Hittite output has a circuit trace going to an output connector:
Cut out about 3/16" of the trace and install the MMIC amplifier in the center of the void. Solder the side ground leads of the MMIC to the pwb grounds on each side of the original trace. It there is no good top ground, drill some holes through the board and bend and insert the MMIC ground leads through the board. Then add two 100 pfd chip caps in series, one on the input and one on the output of the MMIC. Use the Vcc of the Hittite board to power the MMIC output pin, through a dropping resistor and a choke (20 nH to 100 nH). With -6 dBm supplying each MMIC, full output power of +13 dBm (compression level) should result. If there is still room on the Hittite board, you can add a 3 dB resistive pi attenuator. If not, add the attenuator off-board and in line to each Mixer. Or, you could just increase the attenuator in each Mixer by 3 dB. The -6 dB number is Hittite's typical spec. It could be as low as -9 dBm. If so, no output attenuator is necessary, as
the MMIC output would be about +10 dBm (19 dB gain).
  This would add about 76 ma of current consumption for your Hittite board. Make sure its voltage regulator can handle the addition.
Scotty

--- On Wed, 3/16/11, william sprowls <wsprowls@...> wrote:

From: william sprowls <wsprowls@yahoo.com>
Subject: Re: [spectrumanalyzer] Re: YIG PO-2
To: spectrumanalyzer@yahoogroups.com
Date: Wednesday, March 16, 2011, 8:09 PM

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Date: Wednesday, March 16, 2011, 6:53 PM

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Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:

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> both outputs terminated, is 65 dB. I am not on firm ground here, but if as

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> these two outputs without need for the splitter. Then I could follow them

> by a buffer, LNA or whatever to reach MXR2 and MXR3.

>

> Jim

7864. Re: [spectrumanalyzer] Re: YIG PO-2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-17 15:39:07 UTC
From: Jim Hontoria
Topic: 7851 Message: 7864

Analog's adl5513 amp has a noise figure of 0.8 against 2.8+ with the MMIC. the ADL is not solder friendly but other than that do you think is worth the change?

Jim G. Hontoria

Sent from my iPhone

On Mar 17, 2011, at 10:55 AM, william sprowls <wsprowls@...> wrote:

> Hi Jim (and others who are following Jim's YTO plan),
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> Subject: Re: [spectrumanalyzer] Re: YIG PO-2
> To: spectrumanalyzer@yahoogroups.com
> Date: Wednesday, March 16, 2011, 8:09 PM
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7865. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-17 20:10:46 UTC
From: davidhooau
Topic: 7837 Message: 7865

Hi Sam,

Yes, I'm using the 500kHz noise filter we were tuning a few days ago.

I've posted a slightly clearer graph, including the LD alone, with some additional samples to clarify things. Now, at the upper limit between 0dBm and 5dBm, you can see the slope increase as we run out of AGC range, and then the LD run out of range, making the 10dBm sample look better than it really is.

For reference, the minimum AGC gain is now 7dB, the NF is 500kHz wide with an insertion loss of 4dB. The net division ratio from LD to VDBS is 0.68 and the ADC is connected per your current drawing (between the 2k7 and 10k-27k on the AGC unit).

I'm going to have to put testing off for a couple of weeks, as I have a road trip for work.

Cheers,

davidh

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> David,
> The only purpose of looking at the high end is to see whether there is some problem with the module that might also affect the low end, and we don't seem to have found any such problem. So maybe the abrupt flattening at the low end is due to the lack of shielding, as you originally suggested.
>
> If you try adjusting VMag, you'll find that your efforts are largely defeated by the feedback loop. For example, lowering VMag lowers the VGA gain, reducing the log amp input and therefore the feedback voltage. The lower feedback voltage increases the VGA gain, partially cancelling the effect of the original lowering of VMag. You get a similar effect if you adjust the feedback ratio.
>
> I suggest that you put the fencing and lid on the log detector, which is where shielding is the most important, and then check the low end response.
>
> I've been assuming you have the noise filter in place. Is it the 500 kHz filter? Perhaps the only difference between your response and that in my paper is the noise filter width. I used 150 kHz. In my MSA I am using 500 kHz. I did not directly test the response of the Expanded Log Detector with that wider filter, but it did not seem to affect the lowest detectable signal level at the MSA input. Possibly the Expanded Log Detector's low end response would be extended with a narrower filter, but that extra range is not reachable with my narrowest RBW filter, which is now 2 kHz. Maybe a narrower noise filter would be useful when I install my 600 kHz amplifilter. If so, I'll have to reconsider using the switchable noise filter, which would allow a wide noise filter for all RBW's except the narrowest one, where a much narrower one would kick in.
>

> As a rough calculation, if you input to the MSA a signal of -115 dBm and have losses of 20 dB by the time you reach the IF2 amp, the signal is -135 dBm at that point, -107 dBm at the output of the 28 dB amp, and perhaps -110 dBm at the output of the RBW filter. At that point the signal will be accompanied by noise from the amp (say, -174 dBm/Hz plus 4 created by the amp plus 28 due to amplification) equal to -142 dBm/Hz. With a 2 kHz RBW filter with 3 dB loss, that is -142+36-3=-109 dBm of noise, accompanying the -110 dBm signal. The signal would still be discernible, but there would any point in the Expanded Log Detector maintaining a strong response below the -109 dBm noise level, which is about where yours (and maybe mine) peters out. A narrower noise filter would therefore not be of much benefit. With a 600 Hz RBW filter, the noise level would be reduced by 5 dB, so a narrower noise filter might increase the low end range by 5 dB. Maybe not worth the effort.
>
> (Note that a detector that dies below -110 dBm can still detect a -112 dBm signal if the signal is accompanied by enough noise to push the total signal+noise over -110 dBm. The noise actually provides some benefit! The detector needs a range that extends down to the noise level, but the actual detectable signal will extend below the detector's nominal range.)
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> >
> > Hi Sam,
> >
> > To use an American expression, I've thrown you a curve ball.
> >
> > When I plot more samples and look closely at the raw data, I'm only in the "linear" range up until 0dBm input, which is pretty close to VDBS being 1.5V.
> >
> > At +5dBm I'm reading about 2dB high at the LD output, as the slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB with my AGC/LD combination.
> >
> > At 10dBm input limiting is taking place, I'm guessing as the AD8330 runs out of puff, and it just happens that this 10dBm sample is approximately in the same line as the data between -40 and 0dBm. If I'd gathered more samples in the first graph, this would have been much clearer. (memo to self...)
> >
> > I'll adjust VMAG to get the overall AGC gain range correct (15-65dB) and check that my system now functions per your paper.
> >
> > Many thanks for your help with this.
> >
> > davidh
> >
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > David,
> > > Your numbers seem correct. What confuses me is how you can get such a good response

with inputs up to 10 dBm.
> > >
> > > Per p. 16 of the data sheet, with VMag=1.2 and a load of 200 ohms, the max voltage swing at the AD8330 output is +/-1.4V. At the transformer secondary, this would be halved to +/-0.7V. That is 7 dBm. With a gain of 6.8 dB, the AD8330 should start saturating with an input of 0.2 dBm. There would still be increased output with increased input (the output starts to square, but the fundamental content will still increase), but the response should start to flatten at 0.2 dBm input. Your response seems very linear well beyond that.
> > >
> > > It seems odd to be worried about the circuit functioning too well at high input levels, but I wonder whether that is connected with the low end not extending as far as it should.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> > > >
> > > > Sam,
> > > >
> > > > Wilco on the 2k7, and yes, I have 10k/27k giving an overall P of 0.68.
> > > >
> > > > May I again check the VGA levels with you?
> > > >
> > > > Looking only at voltage levels, with VDBS > 1.5V:
> > > >
> > > > > input xfmr: Av=4
> > > > > loss due to 3k9: Av=0.8
> > > > > VGA: Av=1
> > > > > Vmag: Av=2.4
> > > > > output resistors: Av=0.57
> > > > > output transformer: Av=0.5
> > > >
> > > > This gives me an overall gain (50R to 50R) of 2.188 or 6.8dB, which is exactly what I've measured.
> > > >
> > > > What am I missing?
> > > >
> > > > Thanks,
> > > >
> > > > davidh
> > >
> >
>

7866. Re: [spectrumanalyzer] Re: YIG PO-2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-17 21:50:15 UTC
From: Jim Hontoria
Topic: 7851 Message: 7866

Actually the one amplifier I really like is Avago's MGA-633P8 available at
Mouser. 18 dB gain, 0.3 NF, 5 Vcc

Jim W1JGH

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Jim G. Hontoria

7867. Re: [spectrumanalyzer] Re: YIG PO-2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-17 22:57:09 UTC
From: Jim Hontoria
Topic: 7851 Message: 7867

Scotty,

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2. The components are size 402 or 605. Now the wave length of a 1GHz signal is about 12" so are these tiny components really necessary? 605 are a pain but doable but 402 are beyond humans (unless armed with binocular microscopes and very steady hands).

What's your take on this?

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7868. Re: YIG PO-2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-17 23:56:54 UTC
From: Sam
Topic: 7851 Message: 7868

Jim,
If you can solder that IC, 0402 components should be no problem! Maybe all they are trying to achieve with 0402 components is to be able to get all of them near the tiny IC. There is an amazing number of components on the input side.

I think the advantage of Rogers in this context is that (1) vias to bottom ground plane are short (low inductance) and (2) 50-ohm transmission lines are skinny, making it easier to attach the input and output to those tiny little leads without a huge discontinuity. These might be factors that affect gain, but I don't see that they would affect noise figure. But I have used Avago's ABA-52563 on ExpressPCB FR-4 and got good gain at 1-2 GHz.

Sam W.

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> >>
> >> --- On *Wed, 3/16/11, william sprowls <wsprowls@...>* wrote:
> >>
> >>
> >> From: william sprowls <wsprowls@...>
> >> Subject: Re: [spectrumanalyzer] Re: YIG PO-2
> >> To: spectrumanalyzer@yahoogroups.com
> >> Date: Wednesday, March 16, 2011, 8:09 PM
> >>
> >>
> >>
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> >> On Sam's comment I went and looked at the Hittite data sheet. The 65 dB
> >> isolation spec is from either output back to input, not output A to output
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> >>
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> >> Just remove the input attenuators in the SLIM-RFA for full gain.
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> >> Subject: [spectrumanalyzer] Re: YIG PO-2
> >> To: spectrumanalyzer@yahoogroups.com
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> >> MHz, you could try various frequencies from 1013 to 2013 MHz, but of course
> >> you couldn't test at exactly 1024 MHz.
> >> Sam W.
> >>
> >> --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@>
> >> wrote:
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> >> >
> >> > Jim
> >>
> >>
> >>
> >>

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> > --
> > Jim G. Hontoria
> >
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> --
> Jim G. Hontoria
>
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7869. Re: [spectrumanalyzer] Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-18 01:44:41 UTC
From: william sprowls
Topic: 7837 Message: 7869

"Work?". I don't like that kind of language around here.
Scotty

--- On Thu, 3/17/11, davidhooau <dhooke@...> wrote:

From: davidhooau <dhooke@...>
Subject: [spectrumanalyzer] Re: VGA Gain question
To: spectrumanalyzer@yahoogroups.com
Date: Thursday, March 17, 2011, 3:10 PM

Hi Sam,

Yes, I'm using the 500kHz noise filter we were tuning a few days ago.

I've posted a slightly clearer graph, including the LD alone, with some additional samples to clarify things. Now, at the upper limit between 0dBm and 5dBm, you can see the slope increase as we run out of AGC range, and then the LD run out of range, making the 10dBm sample look better than it really is.

For reference, the minimum AGC gain is now 7dB, the NF is 500kHz wide with an insertion loss of 4dB. The net division ratio from LD to VDBS is 0.68 and the ADC is connected per your current drawing (between the 2k7 and 10k-27k on the AGC unit).

I'm going to have to put testing off for a couple of weeks, as I have a road trip for work.

Cheers,

davidh

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:

>

> David,

> The only purpose of looking at the high end is to see whether there is some problem with the module that might also affect the low end, and we don't seem to have found any such problem. So maybe the abrupt flattening at the low end is due to the lack of shielding, as you originally suggested.

>

> If you try adjusting VMag, you'll find that your efforts are largely defeated by the feedback loop. For example, lowering VMag lowers the VGA gain, reducing the log amp input and therefore the feedback voltage. The lower feedback voltage increases the VGA gain, partially cancelling the effect of the original lowering of VMag. You get a similar effect if you adjust the feedback ratio.

>

> I suggest that you put the fencing and lid on the log detector, which is where shielding is the most important, and then check the low end response.

>

> I've been assuming you have the noise filter in place. Is it the 500 kHz filter? Perhaps the only difference between your response and that in my paper is the noise filter width. I used 150 kHz. In my MSA I am using 500 kHz. I did not directly test the response of the Expanded Log Detector with that wider filter, but it did not seem to affect the lowest detectable signal level at the MSA input. Possibly the Expanded Log Detector's low end response would be extended with a narrower filter, but that extra range is not reachable with my narrowest RBW filter, which is now 2 kHz. Maybe a narrower noise filter would be useful when I install my 600 kHz amplifilter. If so, I'll have to reconsider using the switchable noise filter, which would allow a wide noise filter for all RBW's except the narrowest one, where a much narrower one would kick in.

>

> As a rough calculation, if you input to the MSA a signal of -115 dBm and have losses of 20 dB by the time you reach the IF2 amp, the signal is -135 dBm at that point, -107 dBm at the output of the 28 dB amp, and perhaps -110 dBm at the output of the RBW filter. At that point the signal will be accompanied by noise from the amp (say, -174 dBm/Hz plus 4 created by the amp plus 28 due to amplification) equal to -142 dBm/Hz. With a 2 kHz RBW filter with 3 dB loss, that is -142+36-3=-109 dBm of noise, accompanying the -110 dBm signal. The signal would still be discernible, but there would any point in the Expanded Log Detector maintaining a strong response below the -109 dBm noise level, which is about where yours (and maybe mine) peters out. A narrower noise filter would therefore not be of much benefit. With a 600 Hz RBW filter, the noise level would be reduced by 5 dB, so a narrower noise filter might increase the low end range by 5 dB. Maybe not worth
the effort.

>

> (Note that a detector that dies below -110 dBm can still detect a -112 dBm signal if the signal is accompanied by enough noise to push the total signal+noise over -110 dBm. The noise actually provides some benefit! The detector needs a range that extends down to the noise level, but the actual detectable signal will extend below the detector's nominal range.)

>

> Sam W.

>

> --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:

> >

> > Hi Sam,

> >

> > To use an American expression, I've thrown you a curve ball.

> >

> > When I plot more samples and look closely at the raw data, I'm only in the "linear" range up until 0dBm input, which is pretty close to VDBS being 1.5V.

> >

> > At +5dBm I'm reading about 2dB high at the LD output, as the slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB with my AGC/LD combination.

> >

> > At 10dBm input limiting is taking place, I'm guessing as the AD8330 runs out of puff, and it just happens that this 10dBm sample is approximately in the same line as the data between -40 and 0dBm. If I'd gathered more samples in the first graph, this would have been much clearer. (memo to self...)

> >

> > I'll adjust VMAG to get the overall AGC gain range correct (15-65dB) and check that my system now functions per your paper.

> >

> > Many thanks for your help with this.

> >

> > davidh

> >

> >

> >

> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:

> > >

> > > David,

> > > Your numbers seem correct. What confuses me is how you can get such a good response with inputs up to 10 dBm.

> > >

> > > Per p. 16 of the data sheet, with VMag=1.2 and a load of 200 ohms, the max voltage swing at the AD8330 output is +/-1.4V. At the transformer secondary, this would be halved to +/-0.7V. That is 7 dBm. With a gain of 6.8 dB, the AD8330 should start saturating with an input of 0.2 dBm. There would still be increased output with increased input (the output starts to square, but the fundamental content will still increase), but the response should start to flatten at 0.2 dBm input. Your response seems very linear well beyond that.

> > >

> > > It seems odd to be worried about the circuit functioning too well at high input levels, but I wonder whether that is connected with the low end not extending as far as it should.

> > >

> > > Sam W.

> > >

> > > --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:

> > > >

> > > > Sam,

> > > >

> > > > Wilco on the 2k7, and yes, I have 10k/27k giving an overall P of 0.68.

> > > >

> > > > May I again check the VGA levels with you?

> > > >

> > > > Looking only at voltage levels, with VDBS > 1.5V:

> > > >

> > > > > input xfmr: Av=4

> > > > > loss due to 3k9: Av=0.8

> > > > > VGA: Av=1

> > > > > Vmag: Av=2.4

> > > > > output resistors: Av=0.57

> > > > > output transformer: Av=0.5

> > > >

> > > > This gives me an overall gain (50R to 50R) of 2.188 or 6.8dB, which is exactly what I've measured.

> > > >

> > > > What am I missing?

> > > >

> > > > Thanks,

> > > >

> > > > davidh

> > >

> >

>

7870. Re: [spectrumanalyzer] Re: YIG PO-2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-18 01:52:59 UTC
From: william sprowls
Topic: 7851 Message: 7870

Hi Jim,
Rogers material is a highly controlled Er material. Fantastic stuff. And really expensive. And I don't suggest using it for home made boards that need to be put in the kitchen oven for solder reflow. Just a little too much heat will break down the board and create gasses that are deadly. Probably not enough from a 4 inch board, but still I warn people about that.
Scotty

--- On Thu, 3/17/11, Jim Hontoria <jghalpha@...> wrote:

From: Jim Hontoria <jghalpha@...>
Subject: Re: [spectrumanalyzer] Re: YIG PO-2
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Thursday, March 17, 2011, 5:57 PM

Scotty,

Looking at the demo boards of some of the low noise amplifiers I see two things:
1. Rogers materials with fairly consistent dimensional and dielectric properties for the boards which determine the accuracy of trace dimensions
2. The components are size 402 or 605. Now the wave length of a 1GHz signal is about 12" so are these tiny components really necessary? 605 are a pain but doable but 402 are beyond humans (unless armed with binocular microscopes and very steady hands).

What's your take on this?

Jim

On Thu, Mar 17, 2011 at 5:50 PM, Jim Hontoria <jghalpha@...> wrote:

Actually the one amplifier I really like is Avago's MGA-633P8 available at Mouser. 18 dB gain, 0.3 NF, 5 Vcc

Jim W1JGH

On Thu, Mar 17, 2011 at 11:39 AM, Jim Hontoria <jghalpha@...> wrote:

Analog's adl5513 amp has a noise figure of 0.8 against 2.8+ with the MMIC. the ADL is not solder friendly but other than that do you think is worth the change?

Jim G. Hontoria

Sent from my iPhone

On Mar 17, 2011, at 10:55 AM, william sprowls <wsprowls@...> wrote:

Hi Jim (and others who are following Jim's YTO plan),
  I thought I would add an addition to my comment about adding amplifiers. If you have room on your Hittite divider board, you could add the amplifiers there. For example, if each

Hittite output has a circuit trace going to an output connector:

Cut out about 3/16" of the trace and install the MMIC amplifier in the center of the void. Solder the side ground leads of the MMIC to the pwb grounds on each side of the original trace. It there is no good top ground, drill some holes through the board and bend and insert the MMIC ground leads through the board. Then add two 100 pfd chip caps in series, one on the input and one on the output of the MMIC. Use the Vcc of the Hittite board to power the MMIC output pin, through a dropping resistor and a choke (20 nH to 100 nH). With -6 dBm supplying each MMIC, full output power of +13 dBm (compression level) should result. If there is still room on the Hittite board, you can add a 3 dB resistive pi attenuator. If not, add the attenuator off-board and in line to each Mixer. Or, you could just increase the attenuator in each Mixer by 3 dB. The -6 dB number is Hittite's typical spec. It could be as low as -9 dBm. If so, no output attenuator is necessary, as
the MMIC output would be about +10 dBm (19 dB gain).

This would add about 76 ma of current consumption for your Hittite board. Make sure its voltage regulator can handle the addition.
Scotty

--- On Wed, 3/16/11, william sprowls <wsprowls@yahoo.com> wrote:

From: william sprowls <wsprowls@...>
Subject: Re: [spectrumanalyzer] Re: YIG PO-2
To: spectrumanalyzer@yahoogroups.com

Date: Wednesday, March 16, 2011, 8:09 PM

Hi Jim,
On Sam's comment I went and looked at the Hittite data sheet. The 65 dB isolation spec is from either output back to input, not output A to output B. Since both outputs are separated by only the internal source resistors (probably 50 ohm) the output port to output port is probably less than 20 dB. As Sam suggested, you can test the isolation but here is a good method that is a little easier and still provide good results. Bias the input of the Hittite divider so that it has no input and does not oscillate. Each output will be either at a "0" or "1". No toggling at all. This way there is no RF power applied back into your test equipment. The actual isolation results will probably look a bit better than when the Hittite is dividing normally. But it should be within a few dB.

Even if the isolation is crummy, you can still feed each of those outputs to separate amplifiers, such as the SLIM-RFA-1, to feed Mixers 2 and 3.. Just remove the input attenuators in the SLIM-RFA for full gain.
Scotty

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From: Sam <swetterlin@...>
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To: spectrumanalyzer@yahoogroups.com

Date: Wednesday, March 16, 2011, 6:53 PM

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probably 20-30 dB. That should put you in good shape.

It certainly would be possible to construct the YIG+divider and check the reverse isolation. You would input a strong signal to one divider output and look for it in the other divider output. If the divider is outputting 1024 MHz, you could try various frequencies from 1013 to 2013 MHz, but of course you couldn't test at exactly 1024 MHz.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
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> The prescaler has two outputs at 180 degrees from each other. The only other

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> these two outputs without need for the splitter. Then I could follow them
> by a buffer, LNA or whatever to reach MXR2 and MXR3.
>
> Jim

--
Jim G. Hontoria

--
Jim G. Hontoria

7871. Re: [spectrumanalyzer] Re: YIG PO-2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-18 02:05:38 UTC
From: william sprowls
Topic: 7851 Message: 7871

Hi Jim,
 A super low noise figure amplifier is necessary for amplifying signals that are close to the noise floor. The output of your Hittite is nowhere close to the noise floor and would not be justified. Unless they are really cheap and you have a junk box full of them.
  Scotty

--- On Thu, 3/17/11, Jim Hontoria <jghalpha@...> wrote:

From: Jim Hontoria <jghalpha@...>
Subject: Re: [spectrumanalyzer] Re: YIG PO-2
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Thursday, March 17, 2011, 10:39 AM

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full output power of +13 dBm (compression level) should result. If there is still room on the Hittite board, you can add a 3 dB resistive pi attenuator. If not, add the attenuator off-board and in line to each Mixer. Or, you could just increase the attenuator in each Mixer by 3 dB. The -6 dB number is Hittite's typical spec. It could be as low as -9 dBm. If so, no output attenuator is necessary, as the MMIC output would be about +10 dBm (19 dB gain).
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Scotty

--- On Wed, 3/16/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: YIG PO-2
To: spectrumanalyzer@yahoogroups.com
Date: Wednesday, March 16, 2011, 6:53 PM

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> these two outputs without need for the splitter. Then I could follow them

> by a buffer, LNA or whatever to reach MXR2 and MXR3.

>

> Jim

7872. Parts List for Recent Group SLIMs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-18 10:51:57 UTC
From: lh1907
Topic: 7872 Message: 7872

Are the parts list (PL) for any of the following SLIMs located anywhere?
Cal Source,
Leveler,
Active Bridge,
Buffer Amp,
Switched Attenuator,
Fixed Attenuator,
IF2 PreAmp (Pre RBW - Filter Amp),
VGA,
Noise Filter, and
AGC.

Switched Attenuator, and Fixed Attenuator PLs are straight forward. Have printed the ExpressPCB SCH/PCB files for all and if PLs are not available, I plan on starting with schematic and using PCB geometry to determine pkg size of schematic parts (i.e., which IC pkg, which SMT size - 1205, 805, etc). Getting ready to build an order on DigiKey and Mouser sites.

Larry, W2HHV

7873. Re: Parts List for Recent Group SLIMs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-18 13:14:47 UTC
From: Sam
Topic: 7872 Message: 7873

Those are all my boards, and I never do parts lists--it's one more thing to maintain. I rely on the schematics. For ICs, I mark the package type on the schematic, except possibly when there is only one package--like 78L05. All caps and resistors are size 0805 unless otherwise stated; inductors occasionally allow for bigger sizes but small ones will fit too. If in doubt, double-click on the component on the PCB layout in ExpressPCB and it will show the package type.

For caps, resistors and inductors any manufacturer will do unless a specific part number is stated. For ferrites the specific part number is always stated, since that is the only way to specify the frequency range, but another ferrite with similar range is fine. 5% resistors are generally fine unless the schematic calls for higher precision, but if you are ordering them you might as well get 1% instead of 5%. (I use 5% resistors from a Digi-Key kit, but refill with 1% when a value runs low.) For caps, use NP0 when available in that size (up to 1 nF or so).

For TI parts and 0.1% resistors, go with Mouser--better availability and price.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@...> wrote:
>
> Are the parts list (PL) for any of the following SLIMs located anywhere?
> Cal Source,
> Leveler,
> Active Bridge,
> Buffer Amp,
> Switched Attenuator,
> Fixed Attenuator,
> IF2 PreAmp (Pre RBW - Filter Amp),
> VGA,
> Noise Filter, and
> AGC.
>
> Switched Attenuator, and Fixed Attenuator PLs are straight forward. Have printed the ExpressPCB SCH/PCB files for all and if PLs are not available, I plan on starting with schematic and using PCB geometry to determine pkg size of schematic parts (i.e., which IC pkg, which SMT size - 1205, 805, etc). Getting ready to build an order on DigiKey and Mouser sites.
>
> Larry, W2HHV
>

7874. Re: Q of notch filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-18 13:45:49 UTC
From: lh1907
Topic: 7818 Message: 7874

Sam,

Does section 7.9 (Q Measurement of LC Resonator) on Pg 7.36 of Experimental Methods of RF Design shed any light on which approach to take?

Larry, W2HHV

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Here is a very basic electronics question. The Q of a filter equals
> center frequency over bandwidth. The bandwidth is determined as the
> frequency difference between the 3 dB points.
>
> The question is, for a notch filter are the "3 dB points" 3 dB down from
> the top or up from the bottom of the notch.
>
> Several sources indicate that you go 3 dB down from the top whether you
> have a band pass or band stop filter. For example,
>
> <http://www-k.ext.ti.com/SRVS/Data/ti/KnowledgeBases/analog/document/faq\
> s/q.htm>
>
> makes this statement:
>
> "Q is defined as the Quality Factor of a bandpass or notch filter. It is
> defined as the center frequency of a filter divided by the bandwidth.
> The bandwidth is the frequency of the upper 3 dB roll-off point minus
> the frequency of the lower 3 dB roll-off point."
>
> Now, the definition of Q using 3 dB points has to jibe with the
> definition for LC filters, using reactance and resistance. For a series
> LC filter, the unloaded Q is the reactance of L at resonance, divided by
> the series resistance.
>
> Here is some data from RFSim99: Place a series LC circuit shunt to
> ground between a 1 kohm source and load (so it is nearly unloaded). Make
> C=1 nF and L=1 uH with a series R of 1 ohm. It resonates at 5.04 MHz.
> The reactance of L at resonance is 31.7 ohms. Therefore Q by the
> reactance/resistance method is 31.7/1=31.7.
>
> The 3 dB bandwidth is 0.157 MHz if you use points 3 dB above the bottom
> of the notch. It is 80.9 MHz if you use points 3 dB from the top (i.e.
> absolute -3 dB level). Dividing center frequency by bandwidth gives you
> Q=32.1 for the from-the-bottom points and Q=0.062 using the from-the-top
> points.
>

> Obviously, you need to measure the 3 dB points relative to the bottom of
> the notch if you want to get the same Q value using freq/BW as you do
> with reactance/resistance, right?
>
> Ah, but here is the catch. I stated above that I used 1 kohm source and
> load so the LC would be nearly unloaded, but if you view those 1 k
> resistances as becoming part of the series LC circuit, higher resistance
> actually creates more dissipation and reduces the Q. In fact, the
> Q=0.062 value calculated above using absolute -3 dB points is almost
> exactly L reactance (31.7) divided by series resistance (in this case
> considered to be 1 + 1k||1k = 501 ohms).
>
> If you view the notch starting with a low source and load resistance and
> then increase those resistances, the width of the notch at the top
> becomes wider and wider, reflecting the lower Q that results when you
> include the source and load (in parallel) as part of the series
> resistance of the series LC circuit. The bottom of the notch, however,
> initially narrows somewhat as the source and load increase, but once
> they get much bigger than the 1 ohm series resistance there is not much
> change. Large source and load make the top wider and small ones make the
> bottom wider.
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> My conclusion is that you could define Q using either the top or bottom
> pair of 3 dB points, and that definition will be consistent with the
> reactance/resistance definition, provided that you properly calculate
> the resistance. If you use the top 3 dB points, the effective series
> resistance of the LC circuit is the sum of the 1 ohm explicit series
> resistance plus the parallel combo of the source and load (meaning large
> source/load values reduce Q). If you use the bottom 3 dB points to
> define Q by the bandwidth method, you need to treat the source and load
> as being a "parallel load" on the circuit (meaning large source/load
> values increase Q); I can understand that parallel treatment
> qualitatively but I'm not sure of the mathematics--how do you combine
> the effects of the 1 ohm series resistance and the 500 ohm parallel
> resistance (500 being 1k||1k).
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> It does appear that the formal definition of Q for a notch filter uses
> the top 3 dB points. That's what Transmission mode RLC analysis
> currently uses. It has the drawback that the 3 dB points are typically
> very far apart--you get Q values like the 0.062 value above. If those
> points are used, you are much better off using a very low impedance
> fixture, which will give a narrower notch.
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> A corollary of all this is that if the parallel combo of the source and
> load resistances is at least 10 times the internal series resistance of
> the LC circuit (here, 1 ohm), then Q determined with the upper 3 dB
> points will be the loaded Q (QL) of the circuit, and Q determined with
> the bottom 3 dB points will be very close to the unloaded Q of the
> circuit.
>

> I'm still trying to decide how all this affects the optimum way to
> perform RLC analysis.
>
> Sam W.
>

7875. Re: [spectrumanalyzer] Re: Q of notch filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-18 15:21:55 UTC
From: Jim Hontoria
Topic: 7818 Message: 7875

I would say that it is the same as for a low pass where the passing band is counted at the 3 dB from the bottom

Jim G. Hontoria

Sent from my iPhone

On Mar 18, 2011, at 9:45 AM, "lh1907" <llh5@...> wrote:

> Sam,
>
> Does section 7.9 (Q Measurement of LC Resonator) on Pg 7.36 of Experimental Methods of RF Design shed any light on which approach to take?
>
> Larry, W2HHV
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
> >
> > Here is a very basic electronics question. The Q of a filter equals
> > center frequency over bandwidth. The bandwidth is determined as the
> > frequency difference between the 3 dB points.
> >
> > The question is, for a notch filter are the "3 dB points" 3 dB down from
> > the top or up from the bottom of the notch.
> >
> > Several sources indicate that you go 3 dB down from the top whether you
> > have a band pass or band stop filter. For example,
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> > <http://www-k.ext.ti.com/SRVS/Data/ti/KnowledgeBases/analog/document/faq\
> > s/q.htm>
> >
> > makes this statement:
> >
> > "Q is defined as the Quality Factor of a bandpass or notch filter. It is
> > defined as the center frequency of a filter divided by the bandwidth.
> > The bandwidth is the frequency of the upper 3 dB roll-off point minus
> > the frequency of the lower 3 dB roll-off point."
> >
> > Now, the definition of Q using 3 dB points has to jibe with the
> > definition for LC filters, using reactance and resistance. For a series
> > LC filter, the unloaded Q is the reactance of L at resonance, divided by
> > the series resistance.
> >
> > Here is some data from RFSim99: Place a series LC circuit shunt to
> > ground between a 1 kohm source and load (so it is nearly unloaded). Make
> > C=1 nF and L=1 uH with a series R of 1 ohm. It resonates at 5.04 MHz.

> > The reactance of L at resonance is 31.7 ohms. Therefore Q by the
> > reactance/resistance method is 31.7/1=31.7.
> >
> > The 3 dB bandwidth is 0.157 MHz if you use points 3 dB above the bottom
> > of the notch. It is 80.9 MHz if you use points 3 dB from the top (i.e.
> > absolute -3 dB level). Dividing center frequency by bandwidth gives you
> > Q=32.1 for the from-the-bottom points and Q=0.062 using the from-the-top
> > points.
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> > Obviously, you need to measure the 3 dB points relative to the bottom of
> > the notch if you want to get the same Q value using freq/BW as you do
> > with reactance/resistance, right?
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> > Ah, but here is the catch. I stated above that I used 1 kohm source and
> > load so the LC would be nearly unloaded, but if you view those 1 k
> > resistances as becoming part of the series LC circuit, higher resistance
> > actually creates more dissipation and reduces the Q. In fact, the
> > Q=0.062 value calculated above using absolute -3 dB points is almost
> > exactly L reactance (31.7) divided by series resistance (in this case
> > considered to be 1 + 1k||1k = 501 ohms).
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> > If you view the notch starting with a low source and load resistance and
> > then increase those resistances, the width of the notch at the top
> > becomes wider and wider, reflecting the lower Q that results when you
> > include the source and load (in parallel) as part of the series
> > resistance of the series LC circuit. The bottom of the notch, however,
> > initially narrows somewhat as the source and load increase, but once
> > they get much bigger than the 1 ohm series resistance there is not much
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> > A corollary of all this is that if the parallel combo of the source and
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> > I'm still trying to decide how all this affects the optimum way to
> > perform RLC analysis.
> >
> > Sam W.
> >
>
>

7876. Re: Q of notch filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-18 19:09:30 UTC
From: Sam
Topic: 7818 Message: 7876

I don't have Experimental Methods readily available, but here is the conclusion I came to after considerable research. The Q of a complete filter circuit--say, 50 ohm source and load, with a series LC to ground in the middle--is based on the bandwidth between the 3 dB points at the top. That is also the loaded Q (QL) of the LC circuit. The parallel combination of source and load become the series resistance of the LC circuit (along with any intrinsic resistance). Big source and load means small QL. While Q stands for Quality Factor, it judges quality solely by the width of the top of the response, whether bandpass or bandstop, and has nothing to do with what happens at the bottom.

In reality you may be more interested in the depth of a notch (or in the height of a peak) than in the "quality" measured by QL. If you determine bandwidth from the 3 dB points at the bottom of a notch (i.e. 3 dB up from the bottom), and calculate Q=bandwidth/frequency, the "Q" value you get is a useful number but is not the loaded Q of the LC circuit. If the source and load are large (compared to the intrinsic LC resistance), this bottom Q will approximate the unloaded Q (Qu) of the LC circuit. This is interesting because the large source and load with a series LC circuit actually constitute a heavy load on the circuit, and will result in a wide bandwidth at the top, and small QL.

If the source and load are not large, the "Q" you calculate at the bottom will have a fairly complicated relationship to the Qu of the LC circuit.

If you are ultimately trying to determine the Q of an inductor with these measurements (and are assuming C is very high Q), you can do it using either the top 3 dB points (in which case it is best to have a small source and load) or the bottom 3 dB points (in which case large source and load is better). It's just a question of what formula you apply to the results, and for this purpose it is easiest to use the bottom 3 dB points, if the source and load are large. But the true QL of the circuit is the one measured at the top.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> I would say that it is the same as for a low pass where the passing band is counted at the 3 dB from the bottom
>
> Jim G. Hontoria
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> Sent from my iPhone
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> On Mar 18, 2011, at 9:45 AM, "lh1907" <llh5@...> wrote:
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> > Sam,
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> > Does section 7.9 (Q Measurement of LC Resonator) on Pg 7.36 of Experimental Methods of RF Design shed any light on which approach to take?
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> > Larry, W2HHV
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> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > > center frequency over bandwidth. The bandwidth is determined as the
> > > frequency difference between the 3 dB points.
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> > > the frequency of the lower 3 dB roll-off point."
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> > > I'm still trying to decide how all this affects the optimum way to
> > > perform RLC analysis.
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> > > Sam W.
> > >
> >
> >
>

7877. HF306 relay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-18 23:05:49 UTC
From: Sam
Topic: 7877 Message: 7877

I finally received my HF306 relays from DigiKey. Jim's latest board included a transmit/receive board that contains an active bridge, buffer amp, and HF306 relay. It's 12V, single coil, non-latching, 75 ohms but works as low as 9V and for this purpose the 75 ohm impedance is irrelevant. If anyone wants to get this relay, DigiKey now has a couple thousand.

I originally ordered it from Futurelec, but the got an email saying their reels of HF06 were on metal tape, so they decided they could not cut them apart. (What kind of metal is it, anyway?)

Sam W.

7878. Re: [spectrumanalyzer] Amplifilter at 10.7 MHz

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-20 19:00:54 UTC
From: Jim Hontoria
Topic: 7835 Message: 7878

Hi Sam,
I makes sense that the shorter crystals have a higher Lm, since being smaller their Cm will be smaller too. The product of Lm times Cm determines the series resonant frequency, if one goes down the other must go up for the same frequency. It is pure math.

Jim

On Mon, Mar 14, 2011 at 3:18 PM, Sam <swetterlin@...> wrote:

>
>
> After I put in the missing impedance match component, my bandwidth with the
> 10.7 MHz filter became 590 Hz, which is a bit of an increase. The impedance
> match is almost meaningless, as it matches 50->65 ohms and is mainly
> intended as a low pass filter, so I could tinker with it, but I'm going to
> stick with 590 Hz. Which is also nearly what David got with 10.7 MHz
> crystals from an entirely different source, so I'm pleased with the
> consistency.
>
> Anyone who wants a narrower bandwidth near 10.7 MHz might have to find
> crystals with Lm much higher than 10 mH. I tested a 10.73 MHz crystal and
> got 10 mH. I tested a 10.368 MHz crystal and got 22 mH, but the latter is
> too far from 10.7 MHz for the Expanded Log Detector. Interestingly, though
> the crystal with 22 mH was in a short can like Jerry's, as opposed to the
> much taller can for my 10.7 MHz and the 10.73 MHz crystals, which had 10 mH.
> I associate the shorter cans with computer clock crystals. Perhaps that
> style is intentionally made with higher Lm. It would be worth finding some
> crystals near 10.7 MHz in the short can to see how they measure.
>
> Sam W.
>
>
>

--
Jim G. Hontoria

7879. Re: Amplifilter at 10.7 MHz

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-20 21:22:35 UTC
From: Sam
Topic: 7835 Message: 7879

I once took apart one of the big can crystals, and there was almost nothing inside. Two leads leading to a tiny piece of crystal that was located about half way up the can. I think it would have fit into a small can. But you may be right, the small cans may have even smaller crystals.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
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> Hi Sam,
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> smaller their Cm will be smaller too. The product of Lm times Cm determines
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> same frequency. It is pure math.
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> > Sam W.
> >
> >
> >
>
>
>

> --
> Jim G. Hontoria
>

7880. Re: [spectrumanalyzer] Re: Amplifilter at 10.7 MHz

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-20 22:11:12 UTC
From: Jim Hontoria
Topic: 7835 Message: 7880

Also, the higher the frequency, the thinner the crystal (for similar cut
and as long as they are not overtoned) and the Lm will go down. I just
tested some 11 MHz and 20 Mhz and their Lms are around 6 and 4 respectively.
I am on a holding pattern waiting for Express PCB and Digikey for YIG stuff
and the separate Mxr 3 amplifiers. I modified the layout of the later so
that i could get two of them in the 3.8x2.5 board (the rest of the space is
occupied by the Yig interfaace).. I will use a 3/4" copper bushing as a
holder/ shield. Since I am getting 6 amp boards from ExpressPCB I have two
extra ones that you are welcome to have if interested.

Jim

On Sun, Mar 20, 2011 at 5:22 PM, Sam <swetterlin@...> wrote:

>
>
> I once took apart one of the big can crystals, and there was almost nothing
> inside. Two leads leading to a tiny piece of crystal that was located about
> half way up the can. I think it would have fit into a small can. But you may
> be right, the small cans may have even smaller crystals.
> Sam W.
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> > --
> > Jim G. Hontoria
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Jim G. Hontoria

7881. Re: Parts List for Recent Group SLIMs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-22 14:14:38 UTC
From: lh1907
Topic: 7872 Message: 7881

I'm almost finished generating the Mouser/DigiKey orders. A few comments:

1. Switch Noise Filter F1 (SFVLF10M7LF00-B0) BW specs are fn±25kHz min. Schematic specifies 75 kHz BW. Largest BW RBW filter I plan on using thru this signal path is 30 kHz, so 50 kHz should be wide enough.
Mouser's comment against this part is:
Factory Lead-Time: 12 Weeks Manufacturing delays have been reported on this product. Qty 498 in stock and 500 on order.

2. MBRX0540 power polarity protection diode not in stock. Substituted ZHCS400TA Schottky diode part (40 v Vr, 0.4 amp If, 6.7 amp current surge).

And a few questions:

1. Is there any recommended max ESR for solid tantalums? ESR for tantalums on current order are 3.4 ohms (4.7 uF), 4 ohms (10 uF), and 16 ohm (1.0 uF).

2. What are the recommended LPF 3 dB frequency for LFCN-575D filters on MSA/TG Front End Amplifiers for MSA applications. I plan on using a 100 MHz 3 dB frequency initially while these amplifiers are being used with Active Reflection Bridge(ARB). After MSA build/test, the MSA VNA will replace ARB.

3. Since some 805 size SMD resistors are 1/10 watt (rather than 1/8 watt) is this lower power rating acceptable.

4. Is the 5 volt LDO used on Active Reflection Bridge? Schematic shows 6 volts but a comment in Active Reflection Bridge pdf file (page 8) recommends 5 volt LDO.

5. Even though the Cal Source references a 1 MHz source (2 MHz osc), I though I saw some e-mail posting in MSA Group which recommended a higher source frequency (4 MHz?). Low frequency for constant differential phase through stepped attenuators and minimizing waveform edge ringing induced amplitude error but not too low for whatever reason??

Larry, W2HHV

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Those are all my boards, and I never do parts lists--it's one more thing to maintain. I rely on the schematics. For ICs, I mark the package type on the schematic, except possibly when there is only one package--like 78L05. All caps and resistors are size 0805 unless otherwise stated; inductors occasionally allow for bigger sizes but small ones will fit too. If in doubt, double-click on the component on the PCB layout in ExpressPCB and it will show the package type.
>
> For caps, resistors and inductors any manufacturer will do unless a specific part number is stated. For ferrites the specific part number is always stated, since that is the only way to specify the frequency range, but another ferrite with similar range is fine. 5%

resistors are generally fine unless the schematic calls for higher precision, but if you are ordering them you might as well get 1% instead of 5%. (I use 5% resistors from a Digi-Key kit, but refill with 1% when a value runs low.) For caps, use NP0 when available in that size (up to 1 nF or so).
>
> For TI parts and 0.1% resistors, go with Mouser--better availability and price.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@> wrote:
> >
> > Are the parts list (PL) for any of the following SLIMs located anywhere?
> > Cal Source,
> > Leveler,
> > Active Bridge,
> > Buffer Amp,
> > Switched Attenuator,
> > Fixed Attenuator,
> > IF2 PreAmp (Pre RBW - Filter Amp),
> > VGA,
> > Noise Filter, and
> > AGC.
> >
> > Switched Attenuator, and Fixed Attenuator PLs are straight forward. Have printed the ExpressPCB SCH/PCB files for all and if PLs are not available, I plan on starting with schematic and using PCB geometry to determine pkg size of schematic parts (i.e., which IC pkg, which SMT size - 1205, 805, etc). Getting ready to build an order on DigiKey and Mouser sites.
> >
> > Larry, W2HHV
> >
>

7882. Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-22 15:06:15 UTC
From: b767_fan
Topic: 7882 Message: 7882

I had initially tuned my cavity filter using a VNA a few months ago. Everything was as expected, and I was able to easily achieve 70dB of rejection. Now I went back to retune prior to putting together the entire VNA, and I only have about 45dB of rejection at the max, no matter how many combinations of screw lengths I tried.

I'm unsure what might have changed. I replaced the bolts with shorter ones for space savings, but I doubt this would affect anything. Could some dust inside affect it, or perhaps the cables on the outside are a bit damaged? The one does look a bit stressed on the outside, but I'd have to take the whole thing apart to replace it.

7883. Re: Parts List for Recent Group SLIMs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-22 15:41:32 UTC
From: Sam
Topic: 7872 Message: 7883

That ceramic filter is listed in Digi-Key as 25 kHz, which I couldn't believe, so I ordered a couple and tried them. They are actually 75 kHz. I don't think you need to use this filter with any RBW filter broader than 7.5 kHz, but you could try it out. (Even though the bandwidth seems sufficient for a 30 kHz RBW, the center frequency of the ceramic may be off-kilter.)

The original diodes are never in stock any more. There are many substitutes; yours sounds good. The diode voltage drop has some effect on the +20V supply, but any Schottky likely has low drop at such low currents.

The original 10 uF tantalums were cheap and relatively low ESR (1 ohm or less, I believe). I would use ceramics rather than a tantalum with ESR over 1 ohm. Where are the 4.7uF and 1 uF tantalums used?

The main objective of the LFCN filters is to zap signals over 1 GHz. The 575 has a cutoff far above the Active Bridge range so you could use a lower cutoff LFCN, but be sure it maintains decent attenuation in the 1-3 GHz range.

1/10 watt 0805 resistors are fine. I believe that anywhere power is at all an issue, larger sizes are specified, so we never come close to a resistor's max power.

The Active Bridge uses a 78L05 or 78L06, not an LDO. The 5V version is best unless you have a use in mind that requires lowest distortion with high level drive. I used the 6V version when I tested the harmonic level for possible use with the N2PK VNA. (The harmonics were fine.)

The Cal Source was originally intended to use a 2 MHz oscillator for 1 MHz output. Then I realized that the MSA zero-response (the hump around zero with no input) in VNA modes does not disappear sufficiently by 1 MHz, so it interferes with low level calibration. Even at 2 MHz, it will interfere with low level phase calibration. But if you use Scotty's optional buffer amp on the LO3 line to Mixer 3, you will zap the zero response enough that 2 MHz should work well for calibration, and even 1 MHz will be fine down to at least -80 dBm. 2 MHz should create no issues with the Switched Attenuator, except this minor issue: when you attach another attenuator to get more than the Switched Attenuator's max (57.5 dB), you will change the length of the signal path, which can affect phase calibration. If you add 2" of extra length, the effect is 0.15 degree or so. So you may want to start with a 0 dB attenuator in place (such as a barrel connector attached to a bullet) and then replace that when you add a real attenuator. If your extra attenuator is very short, all this may not matter.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@...> wrote:
>
>
> I'm almost finished generating the Mouser/DigiKey orders. A few comments:
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> 1. Switch Noise Filter F1 (SFVLF10M7LF00-B0) BW specs are fn±25kHz min. Schematic specifies 75 kHz BW. Largest BW RBW filter I plan on using thru this signal path is 30 kHz, so 50 kHz should be wide enough.
> Mouser's comment against this part is:
> Factory Lead-Time: 12 Weeks Manufacturing delays have been reported on this product. Qty 498 in stock and 500 on order.
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> And a few questions:
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> 2. What are the recommended LPF 3 dB frequency for LFCN-575D filters on MSA/TG Front End Amplifiers for MSA applications. I plan on using a 100 MHz 3 dB frequency initially while these amplifiers are being used with Active Reflection Bridge(ARB). After MSA build/test, the MSA VNA will replace ARB.
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> 3. Since some 805 size SMD resistors are 1/10 watt (rather than 1/8 watt) is this lower power rating acceptable.
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> 4. Is the 5 volt LDO used on Active Reflection Bridge? Schematic shows 6 volts but a comment in Active Reflection Bridge pdf file (page 8) recommends 5 volt LDO.
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> Larry, W2HHV
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7884. Re: Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-22 15:45:31 UTC
From: Sam
Topic: 7882 Message: 7884

What insertion loss are you getting? I would expect that if there is some type of damage, or a bad cable, the insertion loss would go up dramatically. Unless perhaps you have leaky input and output cables that cross each other.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "b767_fan" <b767_fan@...> wrote:
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>

7885. Re: Parts List for Recent Group SLIMs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-22 17:43:16 UTC
From: lh1907
Topic: 7872 Message: 7885

My take away and comments/questions to two points of Sam's previous message (#7883) reply.

1. Capacitor Types:

The original 10 uF tantalums were cheap and relatively low ESR (1 ohm or less, I believe). I would use ceramics rather than a tantalum with ESR over 1 ohm. Where are the 4.7uF and 1 uF tantalums used?

The where used for the low freq bypass caps are:
SL, ARB, BA, VGA, and SNF for 1 uF,
SL, CS, ARB, BA, and VGA for 4.7 uF, and
SL for 10 uF/16v.
The "Where Used" Legend is SL - Source Leveler, CS - Cal Source, ARB - Active Reflection Bridge, BA - Buffer Amps, VGA - Variable Gain Amp, and SNF - Switched Noise Filter.

Replaced all the tantalum capacitors (1 to 10 uF value range) on order with ceramic. In selecting part options on DigiKey drop down choices, specified Low ESR in application drop down. Upshot in all cases Y5V capacitor type.
Only value, voltage, and part size (805) were specified for RF bypass caps (.001 to .1 uF). Part selected on price was X7R capacitor type in all cases. Did notice Y5V type lower in list at higher price. Is this an ESR issue? Should I change all these caps to Y5V capacitor type?

2. Optimum Cal Source Frequency:

2 MHz Cal Source frequency should create no issues with the Switched Attenuator, except this minor issue: when you attach another attenuator to get more than the Switched Attenuator's max (57.5 dB), you will change the length of the signal path, which can affect phase calibration. If you add 2" of extra length, the effect is 0.15 degree or so. So you may want to start with a 0 dB attenuator in place (such as a barrel connector attached to a bullet) and then replace that when you add a real attenuator. If your extra attenuator is very short, all this may not matter.

Looks like 2 MHz source freq is sweat spot. Changed Epson SG-615P osc part freq to 4 MHz. If path calibration is run using two Switched Attenuators, will this avoid the differential phase bias at low signal levels? I plan on building three Switched Attenuators.
Hopefully, I'll remember to put the optional buffer amp on the LO3 line to Mixer 3. Will this avoid the zero response problem down the MSA noise floor?

Larry, W2HHV

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
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7886. Re: Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-22 17:55:59 UTC
From: b767_fan
Topic: 7882 Message: 7886

About 15dB, whereas before it was around 8.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> What insertion loss are you getting? I would expect that if there is some type of damage, or a bad cable, the insertion loss would go up dramatically. Unless perhaps you have leaky input and output cables that cross each other.
> Sam W.
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7887. Re: [spectrumanalyzer] Re: Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-22 18:16:25 UTC
From: william sprowls
Topic: 7882 Message: 7887

Your wife knocked your filter off your bench and broke it. She didn't fess up to it. Go pee on her sewing machine.
Scotty

--- On Tue, 3/22/11, b767_fan <b767_fan@...> wrote:

From: b767_fan <b767_fan@...>
Subject: [spectrumanalyzer] Re: Cavity filter tuning
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, March 22, 2011, 12:55 PM

About 15dB, whereas before it was around 8.

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7888. Re: [spectrumanalyzer] Re: Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-22 19:16:59 UTC
From: Geoff Moore
Topic: 7882 Message: 7888

Are the new screws exactly the same material as the originals ?? Try the old ones to see if it restores the figures. Did you see the results you quoted when connected to the MSA or just when testing with the VNA. The VNA impedance will be different to the MSA so that may affect the results.

Geoff

----- Original Message -----
From: "william sprowls" <wsprowls@...>
To: <spectrumanalyzer@yahoogroups.com>
Sent: Tuesday, March 22, 2011 6:16 PM
Subject: Re: [spectrumanalyzer] Re: Cavity filter tuning

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--- On Tue, 3/22/11, b767_fan <b767_fan@...> wrote:

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To: spectrumanalyzer@yahoogroups.com
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7889. Re: [spectrumanalyzer] Re: Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-22 19:46:10 UTC
From: william sprowls
Topic: 7882 Message: 7889

I should have added this to my "cutsie" reply:
 The top tuning screws' function is to provide a teeny tiny amount of "end capacitance" to the center stubs. This electrically lengthens the stubs, which lower the resonant frequency. The material (aluminum, steel, brass) makes very little difference in the Q of the filter. The exposed length of screw outside of the top plate makes no difference at all.
 If your insertion loss went from -8 dB to -15 dB, I would suggest that something mechanical has happened. Perhaps:
1. one of your hairpins has lost its contact, cracked solder joint.
2. one of the stubs has lost its solder joint on the bottom plate (a crack)
3. It really did get dropped and one or more of the stubs has been bent. To check, remove the tuning screws and look through the bottom of each stub. The screw hole should line up with the center of the stub.
4. Do not mess with your wife unless #3 held true.
Scotty

--- On Tue, 3/22/11, Geoff Moore <m0ore@...> wrote:

From: Geoff Moore <m0ore@...>
Subject: Re: [spectrumanalyzer] Re: Cavity filter tuning
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, March 22, 2011, 2:16 PM

Are the new screws exactly the same material as the originals ?? Try the old

ones to see if it restores the figures. Did you see the results you quoted

when connected to the MSA or just when testing with the VNA. The VNA

impedance will be different to the MSA so that may affect the results.

Geoff

----- Original Message -----

From: "william sprowls" <wsprowls@...>

To: <spectrumanalyzer@yahoogroups.com>

Sent: Tuesday, March 22, 2011 6:16 PM

Subject: Re: [spectrumanalyzer] Re: Cavity filter tuning

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To: spectrumanalyzer@yahoogroups.com

Date: Tuesday, March 22, 2011, 12:55 PM

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>

7890. Re: Parts List for Recent Group SLIMs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-22 20:10:42 UTC
From: Sam
Topic: 7872 Message: 7890

X7R or X5R ceramics are great. Y5V are terrible; I don't know why they are more expensive. I didn't recall specifying tantalums in all those places. Ceramics are usually lower ESR, but are microphonic, and can generate voltages in the mV range if you tap the module. Normally that is an issue only with large value caps in a circuit with very high gain, but I have sometimes specified tantalums just to be safe. As a practical matter, though, for all these modules ceramics are fine. I suspect you will not be tapping the Cal Source while calibrating. If you were planning to use the Active Bridge or Buffer Amps at frequencies below 100 kHz, though, tantalum caps might have some benefit (due to the low frequency and possibly low signal levels involved).

Yes, using two switched attenuators would eliminate any issue over changing the signal path length when swapping attenuators. (There are still small changes when flipping switches, but very minor.) If you build a second one you could just populate it with 10 or 20 dB attenuators, unless you need finer resolution for other purposes.

A side note on using the switched attenuator. Phase accuracy makes it imperative that the attenuator have 50 ohm input and output impedance (high return loss) to avoid reflections that change when the settings change. It does have high return loss in the low MHz range, but terrible return loss in the 1 GHz range. LO1 signals leaking through Mixer 1 and coming out of the MSA input, reflecting off the attenuator, and then re-entering Mixer 1, can significantly affect phase measurements (and can affect dBm measurement by a few tenths of a dB). You therefore should include a low-pass filter on the MSA input when doing phase calibration. Such a filter is doubly effective, in that if it attenuates 1 GHz by 30 dB it will attenuate LO1 on the way out and attenuate any reflections on their way back in, for a total attenuation of 60 dB (or even more, since the reflections will probably not be 100%).

You can test this high-frequency reflection problem by measuring a signal with and without the lowpass filter. You would think the filter would simply reduce the dBm level due to insertion loss. In my case it actually increases the measured level by 0.2 dB by reflecting LO1 back inside. Note that reflecting LO1 is not a problem as long as the amount of reflection is fixed, and does not vary with different signal sources. The lowpass filter accomplishes that fixed reflection.

Sam W.

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> > > 2. MBRX0540 power polarity protection diode not in stock. Substituted ZHCS400TA Schottky diode part (40 v Vr, 0.4 amp If, 6.7 amp current surge).
> > >
> > > And a few questions:
> > >
> > > 1. Is there any recommended max ESR for solid tantalums? ESR for tantalums on current order are 3.4 ohms (4.7 uF), 4 ohms (10 uF), and 16 ohm (1.0 uF).
> > >
> > > 2. What are the recommended LPF 3 dB frequency for LFCN-575D filters on MSA/TG Front End Amplifiers for MSA applications. I plan on using a 100 MHz 3 dB frequency initially

while these amplifiers are being used with Active Reflection Bridge(ARB). After MSA build/test, the MSA VNA will replace ARB.
> > >
> > > 3. Since some 805 size SMD resistors are 1/10 watt (rather than 1/8 watt) is this lower power rating acceptable.
> > >
> > > 4. Is the 5 volt LDO used on Active Reflection Bridge? Schematic shows 6 volts but a comment in Active Reflection Bridge pdf file (page 8) recommends 5 volt LDO.
> > >
> > > 5. Even though the Cal Source references a 1 MHz source (2 MHz osc), I though I saw some e-mail posting in MSA Group which recommended a higher source frequency (4 MHz?). Low frequency for constant differential phase through stepped attenuators and minimizing waveform edge ringing induced amplitude error but not too low for whatever reason??
> > >
> > > Larry, W2HHV
> > >
> >
>

7891. Re: Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-23 02:26:23 UTC
From: b767_fan
Topic: 7882 Message: 7891

Examining it carefully, I see that two solder joints on the bottom plate are definitely loose and no longer making contact. Could that alone cause the issue? I actually made a typo there, the insertion loss is 50dB...pretty severe.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> I should have added this to my "cutsie" reply:
> Â The top tuning screws' function is to provide a teeny tiny amount of "end capacitance" to the center stubs. This electrically lengthens the stubs, which lower the resonant frequency. The material (aluminum, steel, brass) makes very little difference in the Q of the filter. The exposed length of screw outside of the top plate makes no difference at all.
> Â If your insertion loss went from -8 dB to -15 dB, I would suggest that something mechanical has happened. Perhaps:
> 1. one of your hairpins has lost its contact, cracked solder joint.
> 2. one of the stubs has lost its solder joint on the bottom plate (a crack)
> 3. It really did get dropped and one or more of the stubs has been bent. To check, remove the tuning screws and look through the bottom of each stub. The screw hole should line up with the center of the stub.
> 4. Do not mess with your wife unless #3 held true.
> Scotty
>
> --- On Tue, 3/22/11, Geoff Moore <m0ore@...> wrote:
>
> From: Geoff Moore <m0ore@...>
> Subject: Re: [spectrumanalyzer] Re: Cavity filter tuning
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, March 22, 2011, 2:16 PM
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> Are the new screws exactly the same material as the originals ?? Try the old
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> ones to see if it restores the figures. Did you see the results you quoted
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> when connected to the MSA or just when testing with the VNA. The VNA
>
> impedance will be different to the MSA so that may affect the results.
>
>
>
> Geoff
>
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>
> ----- Original Message -----
>
> From: "william sprowls" <wsprowls@...>
>
> To: <spectrumanalyzer@yahoogroups.com>
>
> Sent: Tuesday, March 22, 2011 6:16 PM
>
> Subject: Re: [spectrumanalyzer] Re: Cavity filter tuning
>
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>
> Your wife knocked your filter off your bench and broke it. She didn't fess
>
> up to it. Go pee on her sewing machine.
>
> Scotty
>
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>
> --- On Tue, 3/22/11, b767_fan <b767_fan@...> wrote:
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> From: b767_fan <b767_fan@...>
>
> Subject: [spectrumanalyzer] Re: Cavity filter tuning
>
> To: spectrumanalyzer@yahoogroups.com
>
> Date: Tuesday, March 22, 2011, 12:55 PM
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>
> About 15dB, whereas before it was around 8.
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> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > What insertion loss are you getting? I would expect that if there is some
>
> > type of damage, or a bad cable, the insertion loss would go up
>
> > dramatically. Unless perhaps you have leaky input and output cables that
>
> > cross each other.
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> > Sam W.
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> > --- In spectrumanalyzer@yahoogroups.com, "b767_fan" <b767_fan@> wrote:
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>
> > > I had initially tuned my cavity filter using a VNA a few months ago.
>
> > > Everything was as expected, and I was able to easily achieve 70dB of
>
> > > rejection. Now I went back to retune prior to putting together the
>
> > > entire VNA, and I only have about 45dB of rejection at the max, no
>
> > > matter how many combinations of screw lengths I tried.
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> > > I'm unsure what might have changed. I replaced the bolts with shorter
>
> > > ones for space savings, but I doubt this would affect anything. Could
>
> > > some dust inside affect it, or perhaps the cables on the outside are a
>
> > > bit damaged? The one does look a bit stressed on the outside, but I'd
>
> > > have to take the whole thing apart to replace it.
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7892. Re: [spectrumanalyzer] Re: Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-23 03:12:21 UTC
From: william sprowls
Topic: 7882 Message: 7892

If the solder joints in question are the hairpins or stubs, yes. These are high current points in the filter and depend on low impedance solder connections.
Scotty

--- On Tue, 3/22/11, b767_fan <b767_fan@...> wrote:

From: b767_fan <b767_fan@...>
Subject: [spectrumanalyzer] Re: Cavity filter tuning
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, March 22, 2011, 9:26 PM

Examining it carefully, I see that two solder joints on the bottom plate are definitely loose and no longer making contact. Could that alone cause the issue? I actually made a typo there, the insertion loss is 50dB...pretty severe.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:

>

> I should have added this to my "cutsie" reply:

> Â The top tuning screws' function is to provide a teeny tiny amount of "end capacitance" to the center stubs. This electrically lengthens the stubs, which lower the resonant frequency. The material (aluminum, steel, brass) makes very little difference in the Q of the filter. The exposed length of screw outside of the top plate makes no difference at all.

> Â If your insertion loss went from -8 dB to -15 dB, I would suggest that something mechanical has happened. Perhaps:

> 1. one of your hairpins has lost its contact, cracked solder joint.

> 2. one of the stubs has lost its solder joint on the bottom plate (a crack)

> 3. It really did get dropped and one or more of the stubs has been bent. To check, remove the tuning screws and look through the bottom of each stub. The screw hole should line up with the center of the stub.

> 4. Do not mess with your wife unless #3 held true.

> Scotty

>

> --- On Tue, 3/22/11, Geoff Moore <m0ore@...> wrote:

>

> From: Geoff Moore <m0ore@...>

> Subject: Re: [spectrumanalyzer] Re: Cavity filter tuning

> To: spectrumanalyzer@yahoogroups.com

> Date: Tuesday, March 22, 2011, 2:16 PM

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> Are the new screws exactly the same material as the originals ?? Try the old

>

> ones to see if it restores the figures. Did you see the results you quoted

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> when connected to the MSA or just when testing with the VNA. The VNA

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> impedance will be different to the MSA so that may affect the results.

>

>

>

> Geoff

>

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>

> ----- Original Message -----

>

> From: "william sprowls" <wsprowls@...>

>

> To: <spectrumanalyzer@yahoogroups.com>

>

> Sent: Tuesday, March 22, 2011 6:16 PM

>

> Subject: Re: [spectrumanalyzer] Re: Cavity filter tuning

>

>

>

> Your wife knocked your filter off your bench and broke it. She didn't fess

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> up to it. Go pee on her sewing machine.

>

> Scotty

>

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> --- On Tue, 3/22/11, b767_fan <b767_fan@...> wrote:

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>

>

> From: b767_fan <b767_fan@...>

>

> Subject: [spectrumanalyzer] Re: Cavity filter tuning

>

> To: spectrumanalyzer@yahoogroups.com

>

> Date: Tuesday, March 22, 2011, 12:55 PM

>

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> About 15dB, whereas before it was around 8.

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> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:

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> > What insertion loss are you getting? I would expect that if there is some

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> > dramatically. Unless perhaps you have leaky input and output cables that

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> > Sam W.

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> > --- In spectrumanalyzer@yahoogroups.com, "b767_fan" <b767_fan@> wrote:

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> > > entire VNA, and I only have about 45dB of rejection at the max, no

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> > > have to take the whole thing apart to replace it.

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7893. Re: Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-23 08:10:50 UTC
From: gusbernardus
Topic: 7882 Message: 7893

One (dumb?) question about the input/output coupling loops.

Instead of being grounded on the base plate would it be al right to ground them on the tube wall (about .7" high) and then make the exit of the coax through a couple of holes in the base plate?

I see you mention high currents in that area and this may be a problem. In my specific assembly, it would be somehow easier to route the coaxial cables if they were protruding from the bottom of the cavity.

Any thoughts?

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> If the solder joints in question are the hairpins or stubs, yes. These are high current points in the filter and depend on low impedance solder connections.
> Scotty

7894. Re: Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-23 13:48:36 UTC
From: Sam
Topic: 7882 Message: 7894

That will work. I did that on several cavity filters. Depending on your soldering procedure, though, the coax may be exposed to more heavy-duty heating in that configuration. Another possibility would be to solder square, panel-mount SMA connectors on the bottom, secured with a single screw to hold them until the solder takes hold. You might have to pre-tin the connector.

You mentioned you might have a bad cable. It occurred to me that if the shield is completely cracked so there is no ground connection, the RF return for that cable will be the shield of the other cable, which might account for your mere 45 dB attenuation. I also have a cracked cable, resulting from relocating the filter and adjusting the cable angle one too many times. I soldered the shield all-around and it works fine.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "gusbernardus" <ssa@...> wrote:
>
>
> One (dumb?) question about the input/output coupling loops.
>
> Instead of being grounded on the base plate would it be al right to
> ground them on the tube wall (about .7" high) and then make the exit
> of the coax through a couple of holes in the base plate?
>
> I see you mention high currents in that area and this may be a problem.
> In my specific assembly, it would be somehow easier to route the coaxial
> cables if they were protruding from the bottom of the cavity.
>
> Any thoughts?
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@>
> wrote:
> >
> > If the solder joints in question are the hairpins or stubs, yes. These
> are high current points in the filter and depend on low impedance solder
> connections.
> > Scotty
>

7895. Re: Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-23 13:50:03 UTC
From: Sam
Topic: 7882 Message: 7895

Sorry, you weren't the one with the possibly bad cable.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> That will work. I did that on several cavity filters. Depending on your soldering procedure, though, the coax may be exposed to more heavy-duty heating in that configuration. Another possibility would be to solder square, panel-mount SMA connectors on the bottom, secured with a single screw to hold them until the solder takes hold. You might have to pre-tin the connector.
>
> You mentioned you might have a bad cable. It occurred to me that if the shield is completely cracked so there is no ground connection, the RF return for that cable will be the shield of the other cable, which might account for your mere 45 dB attenuation. I also have a cracked cable, resulting from relocating the filter and adjusting the cable angle one too many times. I soldered the shield all-around and it works fine.
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> Sam W.
>
>
>
>
> --- In spectrumanalyzer@yahoogroups.com, "gusbernardus" <ssa@> wrote:
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> > of the coax through a couple of holes in the base plate?
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> > In my specific assembly, it would be somehow easier to route the coaxial
> > cables if they were protruding from the bottom of the cavity.
> >
> > Any thoughts?
> >
> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@>
> > wrote:
> > >
> > > If the solder joints in question are the hairpins or stubs, yes. These
> > are high current points in the filter and depend on low impedance solder
> > connections.
> > > Scotty
> >

>

7896. Re: Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-23 18:26:07 UTC
From: gusbernardus
Topic: 7882 Message: 7896

No problem. Thanks for the information.
I was under the impression that it was feasible but an expert opinion is always welcome.
Great idea of putting the sma connector directly on the bottom of the cavity. Back to the drawing board.
Many thanks

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Sorry, you weren't the one with the possibly bad cable.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" swetterlin@ wrote:
> >
> > That will work. I did that on several cavity filters. Depending on your soldering procedure, though, the coax may be exposed to more heavy-duty heating in that configuration. Another possibility would be to solder square, panel-mount SMA connectors on the bottom, secured with a single screw to hold them until the solder takes hold. You might have to pre-tin the connector.

> > Sam W.
> >
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> >
> > --- In spectrumanalyzer@yahoogroups.com, "gusbernardus" <ssa@>
wrote:
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> > > One (dumb?) question about the input/output coupling loops.
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> > > ground them on the tube wall (about .7" high) and then make the
exit
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> > > I see you mention high currents in that area and this may be a
problem.
> > > In my specific assembly, it would be somehow easier to route the
coaxial
> > > cables if they were protruding from the bottom of the cavity.
> > >
> > > Any thoughts?

7897. Re: Parts List for Recent Group SLIMs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-23 19:32:51 UTC
From: lh1907
Topic: 7872 Message: 7897

I'm on the home stretch. Order includes only X7R type ceramic capacitors for 0.001 uF (1 nF) and higher values and NPO or COG temp coefficient type ceramic capacitors for values below 1 nF (1000 pF).

Good idea, I'll populate one stepped attenuator with 10 or 20 dB attenuators in following order 20-10-20-10-20, This will maximize separation between adjacent 20 dB attenuators and may provide enough signal isolation without fencing between each pi-section.

The pi-network, series L, LPF values from Elsie are 42.9 nH and 11.13 pF. Nearest values at Mouser are 43 nH and 11 pF (both +- 5% tolerance). Specs are 180 MHz cutoff frequency and -30 dB at 1 GHz. Five percent limit values changes filter skirt to -28 dB at 1 GHz. I'll lower cutoff freq to generate a lower attenuation (-33 dB bogie) at 1 GHz. This should take care of L/C part value departure from calculated value. 11 pF part is available but 43 nH part is backordered with a 8 week delivery and delay warnings from supplier. DigiKey has no in stock 43 nH inductors in 805 case size. After one more iteration, if I still hit the backorder case for L part, I'll include it in order. Can use a jumper or larger L for now since Active Reflection Bridge will not be used above 30 MHz.

Since the cut off frequency for the LFCN-575D filters is well below 1 GHz, how can the MSA/TG Front End Amplifiers be used and still provide the same calibrated MSA dynamic range at 1 GHz as below LFCN-575D filter 180 MHz cut off frequency?

Larry, W2HHV

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> X7R or X5R ceramics are great. Y5V are terrible; I don't know why they are more expensive. I didn't recall specifying tantalums in all those places. Ceramics are usually lower ESR, but are microphonic, and can generate voltages in the mV range if you tap the module. Normally that is an issue only with large value caps in a circuit with very high gain, but I have sometimes specified tantalums just to be safe. As a practical matter, though, for all these modules ceramics are fine. I suspect you will not be tapping the Cal Source while calibrating. If you were planning to use the Active Bridge or Buffer Amps at frequencies below 100 kHz, though, tantalum caps might have some benefit (due to the low frequency and possibly low signal levels involved).
>
> Yes, using two switched attenuators would eliminate any issue over changing the signal path length when swapping attenuators. (There are still small changes when flipping switches, but very minor.) If you build a second one you could just populate it with 10 or 20 dB attenuators, unless you need finer resolution for other purposes.
>
> A side note on using the switched attenuator. Phase accuracy makes it imperative that the attenuator have 50 ohm input and output impedance (high return loss) to avoid reflections that change when the settings change. It does have high return loss in the low MHz range, but terrible return loss in the 1 GHz range. LO1 signals leaking through Mixer 1 and coming out of the MSA input, reflecting off the attenuator, and then re-entering Mixer 1, can

significantly affect phase measurements (and can affect dBm measurement by a few tenths of a dB). You therefore should include a low-pass filter on the MSA input when doing phase calibration. Such a filter is doubly effective, in that if it attenuates 1 GHz by 30 dB it will attenuate LO1 on the way out and attenuate any reflections on their way back in, for a total attenuation of 60 dB (or even more, since the reflections will probably not be 100%).
>
> You can test this high-frequency reflection problem by measuring a signal with and without the lowpass filter. You would think the filter would simply reduce the dBm level due to insertion loss. In my case it actually increases the measured level by 0.2 dB by reflecting LO1 back inside. Note that reflecting LO1 is not a problem as long as the amount of reflection is fixed, and does not vary with different signal sources. The lowpass filter accomplishes that fixed reflection.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@> wrote:
> >
> > My take away and comments/questions to two points of Sam's previous message (#7883) reply.
> >
> > 1. Capacitor Types:
> >
> > The original 10 uF tantalums were cheap and relatively low ESR (1 ohm or less, I believe). I would use ceramics rather than a tantalum with ESR over 1 ohm. Where are the 4.7uF and 1 uF tantalums used?
> >
> > The where used for the low freq bypass caps are:
> > SL, ARB, BA, VGA, and SNF for 1 uF,
> > SL, CS, ARB, BA, and VGA for 4.7 uF, and
> > SL for 10 uF/16v.
> > The "Where Used" Legend is SL - Source Leveler, CS - Cal Source, ARB - Active Reflection Bridge, BA - Buffer Amps, VGA - Variable Gain Amp, and SNF - Switched Noise Filter.
> >
> > Replaced all the tantalum capacitors (1 to 10 uF value range) on order with ceramic. In selecting part options on DigiKey drop down choices, specified Low ESR in application drop down. Upshot in all cases Y5V capacitor type.
> > Only value, voltage, and part size (805) were specified for RF bypass caps (.001 to .1 uF). Part selected on price was X7R capacitor type in all cases. Did notice Y5V type lower in list at higher price. Is this an ESR issue? Should I change all these caps to Y5V capacitor type?
> >
> > 2. Optimum Cal Source Frequency:
> >
> > 2 MHz Cal Source frequency should create no issues with the Switched Attenuator, except this minor issue: when you attach another attenuator to get more than the Switched Attenuator's max (57.5 dB), you will change the length of the signal path, which can affect phase calibration. If you add 2" of extra length, the effect is 0.15 degree or so. So you may want to start with a 0 dB attenuator in place (such as a barrel connector attached to a bullet) and then replace that when you add a real attenuator. If your extra attenuator is very short, all this may not matter.

> >
> > Looks like 2 MHz source freq is sweat spot. Changed Epson SG-615P osc part freq to 4 MHz.
> > If path calibration is run using two Switched Attenuators, will this avoid the differential phase bias at low signal levels? I plan on building three Switched Attenuators.
> > Hopefully, I'll remember to put the optional buffer amp on the LO3 line to Mixer 3. Will this avoid the zero response problem down the MSA noise floor?
> >
> > Larry, W2HHV
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > That ceramic filter is listed in Digi-Key as 25 kHz, which I couldn't believe, so I ordered a couple and tried them. They are actually 75 kHz. I don't think you need to use this filter with any RBW filter broader than 7.5 kHz, but you could try it out. (Even though the bandwidth seems sufficient for a 30 kHz RBW, the center frequency of the ceramic may be off-kilter.)
> > >
> > > The original diodes are never in stock any more. There are many substitutes; yours sounds good. The diode voltage drop has some effect on the +20V supply, but any Schottky likely has low drop at such low currents.
> > >
> > > The original 10 uF tantalums were cheap and relatively low ESR (1 ohm or less, I believe). I would use ceramics rather than a tantalum with ESR over 1 ohm. Where are the 4.7uF and 1 uF tantalums used?
> > >
> > > The main objective of the LFCN filters is to zap signals over 1 GHz. The 575 has a cutoff far above the Active Bridge range so you could use a lower cutoff LFCN, but be sure it maintains decent attenuation in the 1-3 GHz range.
> > >
> > > 1/10 watt 0805 resistors are fine. I believe that anywhere power is at all an issue, larger sizes are specified, so we never come close to a resistor's max power.
> > >
> > > The Active Bridge uses a 78L05 or 78L06, not an LDO. The 5V version is best unless you have a use in mind that requires lowest distortion with high level drive. I used the 6V version when I tested the harmonic level for possible use with the N2PK VNA. (The harmonics were fine.)
> > >
> > > The Cal Source was originally intended to use a 2 MHz oscillator for 1 MHz output. Then I realized that the MSA zero-response (the hump around zero with no input) in VNA modes does not disappear sufficiently by 1 MHz, so it interferes with low level calibration. Even at 2 MHz, it will interfere with low level phase calibration. But if you use Scotty's optional buffer amp on the LO3 line to Mixer 3, you will zap the zero response enough that 2 MHz should work well for calibration, and even 1 MHz will be fine down to at least -80 dBm. 2 MHz should create no issues with the Switched Attenuator, except this minor issue: when you attach another attenuator to get more than the Switched Attenuator's max (57.5 dB), you will change the length of the signal path, which can affect phase calibration. If you add 2" of extra length, the effect is 0.15 degree or so. So you may want to start with a 0 dB attenuator in place (such as a barrel connector attached to a

bullet) and then replace that when you add a real attenuator. If your extra attenuator is very short, all this may not matter.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@> wrote:
> > > >
> > > >
> > > > I'm almost finished generating the Mouser/DigiKey orders. A few comments:
> > > >
> > > > 1. Switch Noise Filter F1 (SFVLF10M7LF00-B0) BW specs are fn±25kHz min. Schematic specifies 75 kHz BW. Largest BW RBW filter I plan on using thru this signal path is 30 kHz, so 50 kHz should be wide enough.
> > > > Mouser's comment against this part is:
> > > > Factory Lead-Time: 12 Weeks Manufacturing delays have been reported on this product. Qty 498 in stock and 500 on order.
> > > >
> > > > 2. MBRX0540 power polarity protection diode not in stock. Substituted ZHCS400TA Schottky diode part (40 v Vr, 0.4 amp If, 6.7 amp current surge).
> > > >
> > > > And a few questions:
> > > >
> > > > 1. Is there any recommended max ESR for solid tantalums? ESR for tantalums on current order are 3.4 ohms (4.7 uF), 4 ohms (10 uF), and 16 ohm (1.0 uF).
> > > >
> > > > 2. What are the recommended LPF 3 dB frequency for LFCN-575D filters on MSA/TG Front End Amplifiers for MSA applications. I plan on using a 100 MHz 3 dB frequency initially while these amplifiers are being used with Active Reflection Bridge(ARB). After MSA build/test, the MSA VNA will replace ARB.
> > > >
> > > > 3. Since some 805 size SMD resistors are 1/10 watt (rather than 1/8 watt) is this lower power rating acceptable.
> > > >
> > > > 4. Is the 5 volt LDO used on Active Reflection Bridge? Schematic shows 6 volts but a comment in Active Reflection Bridge pdf file (page 8) recommends 5 volt LDO.
> > > >
> > > > 5. Even though the Cal Source references a 1 MHz source (2 MHz osc), I though I saw some e-mail posting in MSA Group which recommended a higher source frequency (4 MHz?). Low frequency for constant differential phase through stepped attenuators and minimizing waveform edge ringing induced amplitude error but not too low for whatever reason??
> > > >
> > > > Larry, W2HHV
> > > >
> > >
> >
>

7898. Re: [spectrumanalyzer] Re: Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-23 20:35:26 UTC
From: william sprowls
Topic: 7882 Message: 7898

Not a dumb question, at all.
 It is fine to do as you suggest. The high current is at the point where the hairpin is soldered, either to the wall or to the base.
Scotty

--- On Wed, 3/23/11, gusbernardus <ssa@...> wrote:

From: gusbernardus <ssa@...>
Subject: [spectrumanalyzer] Re: Cavity filter tuning
To: spectrumanalyzer@yahoogroups.com
Date: Wednesday, March 23, 2011, 3:10 AM

One (dumb?) question about the input/output coupling loops.

Instead of being grounded on the base plate would it be al right to

ground them on the tube wall (about .7" high) and then make the exit

of the coax through a couple of holes in the base plate?

I see you mention high currents in that area and this may be a problem.

In my specific assembly, it would be somehow easier to route the coaxial

cables if they were protruding from the bottom of the cavity.

Any thoughts?

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...>

wrote:

>

> If the solder joints in question are the hairpins or stubs, yes. These

are high current points in the filter and depend on low impedance solder

connections.

> Scotty

7899. Re: [spectrumanalyzer] Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-23 21:14:23 UTC
From: William Dillon
Topic: 7882 Message: 7899

While we're all on the topic of cavity filters,

I think I need to make a new one, as my first one was ... less than functional, and I was reading Sam's page about cavity filters. I was wondering if it would work to file channels on the bottoms of the pipes between chambers, just big enough for the whiskers. The reason behind the idea is that I had a really hard time drilling those holes in exactly the right places. That way, I'd only have to drill the holes for the center resonator.

Is that dumb idea??

On Mar 23, 2011, at 1:35 PM, william sprowls wrote:

> Not a dumb question, at all.
> It is fine to do as you suggest. The high current is at the point where the hairpin is soldered, either to the wall or to the base.
> Scotty
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> --- On Wed, 3/23/11, gusbernardus <ssa@...> wrote:
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> In my specific assembly, it would be somehow easier to route the coaxial
> cables if they were protruding from the bottom of the cavity.
>
> Any thoughts?
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...>
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> >
> > If the solder joints in question are the hairpins or stubs, yes. These
> are high current points in the filter and depend on low impedance solder
> connections.
> > Scotty
>

>
>

7900. Re: Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-23 21:38:28 UTC
From: Sam
Topic: 7882 Message: 7900

Yes, that does work, if by whiskers you mean the coupling loops (hairpins). In theory, you are making the loop a tiny bit shorter by doing that, so the upper hole should be moved up a little, but that all may be within the margin of error.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> While we're all on the topic of cavity filters,
>
> I think I need to make a new one, as my first one was ... less than functional, and I was reading Sam's page about cavity filters. I was wondering if it would work to file channels on the bottoms of the pipes between chambers, just big enough for the whiskers. The reason behind the idea is that I had a really hard time drilling those holes in exactly the right places. That way, I'd only have to drill the holes for the center resonator.
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> > In my specific assembly, it would be somehow easier to route the coaxial
> > cables if they were protruding from the bottom of the cavity.
> >
> > Any thoughts?
> >

> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@>
> > wrote:
> > >
> > > If the solder joints in question are the hairpins or stubs, yes. These
> > are high current points in the filter and depend on low impedance solder
> > connections.
> > > Scotty
> >
> >
> >
>

7901. Re: [spectrumanalyzer] Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-24 10:00:21 UTC
From: SFC
Topic: 7882 Message: 7901

Hi,

I had the same problem (my tools are limited) and I solved this by making slots instead of one holes in the bottom plate. This way I could move the hairpins closer or further from the wall (tuning it). I closed the slots with solder. The result is a bw of just under 2mhz.

Simon

----- Original Message -----
From: William Dillon
To: spectrumanalyzer@yahoogroups.com
Sent: Wednesday, March 23, 2011 10:14 PM
Subject: Re: [spectrumanalyzer] Cavity filter tuning

While we're all on the topic of cavity filters,

I think I need to make a new one, as my first one was ... less than functional, and I was reading Sam's page about cavity filters. I was wondering if it would work to file channels on the bottoms of the pipes between chambers, just big enough for the whiskers. The reason behind the idea is that I had a really hard time drilling those holes in exactly the right places. That way, I'd only have to drill the holes for the center resonator.

Is that dumb idea??

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To: spectrumanalyzer@yahoogroups.com
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Any thoughts?

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connections.
> Scotty

_____ NOD32 5980 (20110324) Informatie _____

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http://www.nod32.nl

7902. Re: Parts List for Recent Group SLIMs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-24 11:19:56 UTC
From: lh1907
Topic: 7872 Message: 7902

The L/C values selected for the LFCN-575D filters on the MSA/TG Front End Amplifiers are 47 nH and 12 pF. The resulting Elsie frequency response is -34 dB at 1 GHz with a 160 MHz, -3 dB break frequency. The L specs on Mouser part are great: Q=40 @200 MHz, Fr=1.4 GHz, Rdc=.31 ohm, on an unshielded ceramic core. This part has an EOL notice but qty 2000 are available.

I'll place orders after breakfast.

Larry, W2HHV

--- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@...> wrote:
>
> I'm on the home stretch. Order includes only X7R type ceramic capacitors for 0.001 uF (1 nF) and higher values and NPO or COG temp coefficient type ceramic capacitors for values below 1 nF (1000 pF).
>
> Good idea, I'll populate one stepped attenuator with 10 or 20 dB attenuators in following order 20-10-20-10-20, This will maximize separation between adjacent 20 dB attenuators and may provide enough signal isolation without fencing between each pi-section.
>
> The pi-network, series L, LPF values from Elsie are 42.9 nH and 11.13 pF. Nearest values at Mouser are 43 nH and 11 pF (both +- 5% tolerance). Specs are 180 MHz cutoff frequency and -30 dB at 1 GHz. Five percent limit values changes filter skirt to -28 dB at 1 GHz. I'll lower cutoff freq to generate a lower attenuation (-33 dB bogie) at 1 GHz. This should take care of L/C part value departure from calculated value. 11 pF part is available but 43 nH part is backordered with a 8 week delivery and delay warnings from supplier. DigiKey has no in stock 43 nH inductors in 805 case size. After one more iteration, if I still hit the backorder case for L part, I'll include it in order. Can use a jumper or larger L for now since Active Reflection Bridge will not be used above 30 MHz.
>
> Since the cut off frequency for the LFCN-575D filters is well below 1 GHz, how can the MSA/TG Front End Amplifiers be used and still provide the same calibrated MSA dynamic range at 1 GHz as below LFCN-575D filter 180 MHz cut off frequency?
>
> Larry, W2HHV
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > X7R or X5R ceramics are great. Y5V are terrible; I don't know why they are more expensive. I didn't recall specifying tantalums in all those places. Ceramics are usually lower ESR, but are microphonic, and can generate voltages in the mV range if you tap the module. Normally that is an issue only with large value caps in a circuit with very high gain, but I have sometimes specified tantalums just to be safe. As a practical matter, though, for all these modules ceramics are fine. I suspect you will not be tapping the Cal Source while calibrating. If you were planning to use the Active Bridge or Buffer Amps at frequencies below 100 kHz, though, tantalum caps might have some benefit (due to the low

frequency and possibly low signal levels involved).
> >
> > Yes, using two switched attenuators would eliminate any issue over changing the signal path length when swapping attenuators. (There are still small changes when flipping switches, but very minor.) If you build a second one you could just populate it with 10 or 20 dB attenuators, unless you need finer resolution for other purposes.
> >
> > A side note on using the switched attenuator. Phase accuracy makes it imperative that the attenuator have 50 ohm input and output impedance (high return loss) to avoid reflections that change when the settings change. It does have high return loss in the low MHz range, but terrible return loss in the 1 GHz range. LO1 signals leaking through Mixer 1 and coming out of the MSA input, reflecting off the attenuator, and then re-entering Mixer 1, can significantly affect phase measurements (and can affect dBm measurement by a few tenths of a dB). You therefore should include a low-pass filter on the MSA input when doing phase calibration. Such a filter is doubly effective, in that if it attenuates 1 GHz by 30 dB it will attenuate LO1 on the way out and attenuate any reflections on their way back in, for a total attenuation of 60 dB (or even more, since the reflections will probably not be 100%).
> >
> > You can test this high-frequency reflection problem by measuring a signal with and without the lowpass filter. You would think the filter would simply reduce the dBm level due to insertion loss. In my case it actually increases the measured level by 0.2 dB by reflecting LO1 back inside. Note that reflecting LO1 is not a problem as long as the amount of reflection is fixed, and does not vary with different signal sources. The lowpass filter accomplishes that fixed reflection.
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@> wrote:
> > >
> > > My take away and comments/questions to two points of Sam's previous message (#7883) reply.
> > >
> > > 1. Capacitor Types:
> > >
> > > The original 10 uF tantalums were cheap and relatively low ESR (1 ohm or less, I believe). I would use ceramics rather than a tantalum with ESR over 1 ohm. Where are the 4.7uF and 1 uF tantalums used?
> > >
> > > The where used for the low freq bypass caps are:
> > > SL, ARB, BA, VGA, and SNF for 1 uF,
> > > SL, CS, ARB, BA, and VGA for 4.7 uF, and
> > > SL for 10 uF/16v.
> > > The "Where Used" Legend is SL - Source Leveler, CS - Cal Source, ARB - Active Reflection Bridge, BA - Buffer Amps, VGA - Variable Gain Amp, and SNF - Switched Noise Filter.
> > >
> > > Replaced all the tantalum capacitors (1 to 10 uF value range) on order with ceramic. In selecting part options on DigiKey drop down choices, specified Low ESR in application drop down. Upshot in all cases Y5V capacitor type.
> > > Only value, voltage, and part size (805) were specified for RF bypass caps (.001 to

.1 uF). Part selected on price was X7R capacitor type in all cases. Did notice Y5V type lower in list at higher price. Is this an ESR issue? Should I change all these caps to Y5V capacitor type?
> > >
> > > 2. Optimum Cal Source Frequency:
> > >
> > > 2 MHz Cal Source frequency should create no issues with the Switched Attenuator, except this minor issue: when you attach another attenuator to get more than the Switched Attenuator's max (57.5 dB), you will change the length of the signal path, which can affect phase calibration. If you add 2" of extra length, the effect is 0.15 degree or so. So you may want to start with a 0 dB attenuator in place (such as a barrel connector attached to a bullet) and then replace that when you add a real attenuator. If your extra attenuator is very short, all this may not matter.
> > >
> > > Looks like 2 MHz source freq is sweat spot. Changed Epson SG-615P osc part freq to 4 MHz.
> > > If path calibration is run using two Switched Attenuators, will this avoid the differential phase bias at low signal levels? I plan on building three Switched Attenuators.
> > > Hopefully, I'll remember to put the optional buffer amp on the LO3 line to Mixer 3. Will this avoid the zero response problem down the MSA noise floor?
> > >
> > > Larry, W2HHV
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >
> > > > That ceramic filter is listed in Digi-Key as 25 kHz, which I couldn't believe, so I ordered a couple and tried them. They are actually 75 kHz. I don't think you need to use this filter with any RBW filter broader than 7.5 kHz, but you could try it out. (Even though the bandwidth seems sufficient for a 30 kHz RBW, the center frequency of the ceramic may be off-kilter.)
> > > >
> > > > The original diodes are never in stock any more. There are many substitutes; yours sounds good. The diode voltage drop has some effect on the +20V supply, but any Schottky likely has low drop at such low currents.
> > > >
> > > > The original 10 uF tantalums were cheap and relatively low ESR (1 ohm or less, I believe). I would use ceramics rather than a tantalum with ESR over 1 ohm. Where are the 4.7uF and 1 uF tantalums used?
> > > >
> > > > The main objective of the LFCN filters is to zap signals over 1 GHz. The 575 has a cutoff far above the Active Bridge range so you could use a lower cutoff LFCN, but be sure it maintains decent attenuation in the 1-3 GHz range.
> > > >
> > > > 1/10 watt 0805 resistors are fine. I believe that anywhere power is at all an issue, larger sizes are specified, so we never come close to a resistor's max power.
> > > >
> > > > The Active Bridge uses a 78L05 or 78L06, not an LDO. The 5V version is best unless you have a use in mind that requires lowest distortion with high level drive. I used the 6V version when I tested the harmonic level for possible use with the N2PK VNA. (The harmonics were fine.)

> > > >
> > > > The Cal Source was originally intended to use a 2 MHz oscillator for 1 MHz output. Then I realized that the MSA zero-response (the hump around zero with no input) in VNA modes does not disappear sufficiently by 1 MHz, so it interferes with low level calibration. Even at 2 MHz, it will interfere with low level phase calibration. But if you use Scotty's optional buffer amp on the LO3 line to Mixer 3, you will zap the zero response enough that 2 MHz should work well for calibration, and even 1 MHz will be fine down to at least -80 dBm. 2 MHz should create no issues with the Switched Attenuator, except this minor issue: when you attach another attenuator to get more than the Switched Attenuator's max (57.5 dB), you will change the length of the signal path, which can affect phase calibration. If you add 2" of extra length, the effect is 0.15 degree or so. So you may want to start with a 0 dB attenuator in place (such as a barrel connector attached to a bullet) and then replace that when you add a real attenuator. If your extra attenuator is very short, all this may not matter.
> > > >
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@> wrote:
> > > > >
> > > > >
> > > > > I'm almost finished generating the Mouser/DigiKey orders. A few comments:
> > > > >
> > > > > 1. Switch Noise Filter F1 (SFVLF10M7LF00-B0) BW specs are fn±25kHz min. Schematic specifies 75 kHz BW. Largest BW RBW filter I plan on using thru this signal path is 30 kHz, so 50 kHz should be wide enough.
> > > > > Mouser's comment against this part is:
> > > > > Factory Lead-Time: 12 Weeks Manufacturing delays have been reported on this product. Qty 498 in stock and 500 on order.
> > > > >
> > > > > 2. MBRX0540 power polarity protection diode not in stock. Substituted ZHCS400TA Schottky diode part (40 v Vr, 0.4 amp If, 6.7 amp current surge).
> > > > >
> > > > > And a few questions:
> > > > >
> > > > > 1. Is there any recommended max ESR for solid tantalums? ESR for tantalums on current order are 3.4 ohms (4.7 uF), 4 ohms (10 uF), and 16 ohm (1.0 uF).
> > > > >
> > > > > 2. What are the recommended LPF 3 dB frequency for LFCN-575D filters on MSA/TG Front End Amplifiers for MSA applications. I plan on using a 100 MHz 3 dB frequency initially while these amplifiers are being used with Active Reflection Bridge(ARB). After MSA build/test, the MSA VNA will replace ARB.
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> > > > > 3. Since some 805 size SMD resistors are 1/10 watt (rather than 1/8 watt) is this lower power rating acceptable.
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> > > > > 4. Is the 5 volt LDO used on Active Reflection Bridge? Schematic shows 6 volts but a comment in Active Reflection Bridge pdf file (page 8) recommends 5 volt LDO.
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Low frequency for constant differential phase through stepped attenuators and minimizing waveform edge ringing induced amplitude error but not too low for whatever reason??
> > > > >
> > > > > Larry, W2HHV
> > > > >
> > > >
> > >
> >
>

7903. Re: Parts List for Recent Group SLIMs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-24 12:53:18 UTC
From: Sam
Topic: 7872 Message: 7903

The LFCN-575D filters were intended to use that actual part from MiniCircuits. An LC filter can also work if you can get the L to span from input to output over the intervening ground connection. If you've determined that you only need 47 nH, you might get good results with a few turns of wire around a screw (then removing the screw, of course).
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@...> wrote:
>
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>

7904. Re: [spectrumanalyzer] Re: Parts List for Recent Group SLIMs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-25 01:09:45 UTC
From: Steve
Topic: 7872 Message: 7904

Sam,

About the switched attenuator shown on your website . . . does it need fencing between attenuator sections?

Thanks.

Steve K8JQ

On 3/24/2011 7:19 AM, lh1907 wrote:
> The L/C values selected for the LFCN-575D filters on the MSA/TG Front End Amplifiers are 47 nH and 12 pF. The resulting Elsie frequency response is -34 dB at 1 GHz with a 160 MHz, -3 dB break frequency. The L specs on Mouser part are great: Q=40 @200 MHz, Fr=1.4 GHz, Rdc=.31 ohm, on an unshielded ceramic core. This part has an EOL notice but qty 2000 are available.
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> I'll place orders after breakfast.
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>> I'm on the home stretch. Order includes only X7R type ceramic capacitors for 0.001 uF (1 nF) and higher values and NPO or COG temp coefficient type ceramic capacitors for values below 1 nF (1000 pF).
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>> Good idea, I'll populate one stepped attenuator with 10 or 20 dB attenuators in following order 20-10-20-10-20, This will maximize separation between adjacent 20 dB attenuators and may provide enough signal isolation without fencing between each pi-section.
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> Yahoo! Groups Links
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Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

7905. Re: Parts List for Recent Group SLIMs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-03-25 13:36:14 UTC
From: Sam
Topic: 7872 Message: 7905

No fencing required. It was tested well beyond its intended frequency of use and worked well without fencing. Its attenuation and return loss remain extremely good beyond 10 MHz. They slowly deteriorate, but it still makes a functional attenuator to 500 MHz, though it is not a high precision tool beyond maybe a few tens of MHz. Phase changes between settings can be assumed negligible only for a few MHz.

I wrapped a brass sheet from one end to the other over the bottom (resistor side) just for mechanical protection. Two sides of that bottom cover are left open.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
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> >>>>>> And a few questions:
> >>>>>>
> >>>>>> 1. Is there any recommended max ESR for solid tantalums? ESR for tantalums on current order are 3.4 ohms (4.7 uF), 4 ohms (10 uF), and 16 ohm (1.0 uF).
> >>>>>>
> >>>>>> 2. What are the recommended LPF 3 dB frequency for LFCN-575D filters on MSA/TG Front End Amplifiers for MSA applications. I plan on using a 100 MHz 3 dB frequency initially while these amplifiers are being used with Active Reflection Bridge(ARB). After MSA build/test, the MSA VNA will replace ARB.
> >>>>>>
> >>>>>> 3. Since some 805 size SMD resistors are 1/10 watt (rather than 1/8 watt) is this lower power rating acceptable.
> >>>>>>
> >>>>>> 4. Is the 5 volt LDO used on Active Reflection Bridge? Schematic shows 6 volts but a comment in Active Reflection Bridge pdf file (page 8) recommends 5 volt LDO.
> >>>>>>
> >>>>>> 5. Even though the Cal Source references a 1 MHz source (2 MHz osc), I though I saw some e-mail posting in MSA Group which recommended a higher source frequency (4 MHz?). Low frequency for constant differential phase through stepped attenuators and minimizing waveform edge ringing induced amplitude error but not too low for whatever reason??
> >>>>>>
> >>>>>> Larry, W2HHV
> >>>>>>
> >
> >
> >
> > ------------------------------------
> >
> > Yahoo! Groups Links
> >
> >
> >
> >
>
> --
> Read The Patriot Post Vertitas vos Liberabit
> http://patriotpost.us/subscription/
>

7906. Amplifilter PCB file

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-01 07:41:15 UTC
From: davidhooau
Topic: 7906 Message: 7906

Hi Folks,

The amplifilter included in the recent filter panel is labelled 1/27/11. The ExpressPCB design file in the associated zip file is labelled 1/26/11, and has quite a few differences to the actual PCB.

Can someone point me in the direction of the correct ExpressPCB file please?

Cheers,

davidh

7907. Re: Amplifilter PCB file

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-01 09:43:05 UTC
From: Sam
Topic: 7906 Message: 7907

In the Files section under Amplifilter.zip. The schematic was there previously, but I just replaced it with a zip file with both schematic and PCB. The PCB is probably the same as what you have. The schematic has been updated, primarily to add and reorganize the notes. Also, a new page was added with the schematic to match the layout of the consolidated RBW filter board (switch + 4 filters) that nobody has actually made yet.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Hi Folks,
>
> The amplifilter included in the recent filter panel is labelled 1/27/11. The ExpressPCB design file in the associated zip file is labelled 1/26/11, and has quite a few differences to the actual PCB.
>
> Can someone point me in the direction of the correct ExpressPCB file please?
>
> Cheers,
>
> davidh
>

7908. Re: Looking for plot of first IF filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-01 15:23:22 UTC
From: Greg Broburg
Topic: 7908 Message: 7908

Just looking for a plot of the finished coaxial filter, I thought that there was one on the Groups site but for some reason cant seem to locate it. Any suggestions. Many thanks. Greg

7909. Re: Looking for plot of first IF filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-01 15:43:32 UTC
From: n6tdt
Topic: 7908 Message: 7909

Greg

In the files section, if you look at the document Coax filter kit assembly notes-4.doc, it contains a picture of what the response of the cavity filter should look like.

Optionally there are several pictures in Len Spyker's photo album. He has a lot of pictures but the ones showing the frequency response all start on page #2.

This may not be exactly what you are looking for but it will show you what your own filter should look like when properly tuned.

--- In spectrumanalyzer@yahoogroups.com, Greg Broburg <semiflex@...> wrote:
>
> Just looking for a plot of the finished coaxial filter, I thought that
> there was one on the Groups site but for some reason cant seem to locate
> it. Any suggestions. Many thanks. Greg
>

7910. Re: Looking for plot of first IF filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-01 15:44:16 UTC
From: Sam
Topic: 7908 Message: 7910

Here's one:
<http://f1.grp.yahoofs.com/v1/cOiVTQUZPTq0brRHpOBsmIpUh8NevU2RBai9kv3t9_aHfSTTH_R_LKqGdByiRs9QKId64Ouj-V5PNQ3EQBNu9w/Sam%27s%20Filter%20Plots/SSABcavityskirttest.bmp>

It's in a folder with some scans of early experimental cavities that I did. I think this one was actually Scotty's filter.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Greg Broburg <semiflex@...> wrote:
>
> Just looking for a plot of the finished coaxial filter, I thought that
> there was one on the Groups site but for some reason cant seem to locate
> it. Any suggestions. Many thanks. Greg
>

7911. Re: Looking for plot of first IF filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-01 20:48:21 UTC
From: inlinebeginner
Topic: 7908 Message: 7911

Here is the one I measured, you can see several curves

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1237712515/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Here's one:
> <http://f1.grp.yahoofs.com/v1/cOiVTQUZPTq0brRHpOBsmIpUh8NevU2RBai9kv3t9_aHfSTTH_R_LKqGdByiRs9QKId64Ouj-V5PNQ3EQBNu9w/Sam%27s%20Filter%20Plots/SSABcavityskirttest.bmp>
>
> It's in a folder with some scans of early experimental cavities that I did. I think this one was actually Scotty's filter.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Greg Broburg <semiflex@> wrote:
> >
> > Just looking for a plot of the finished coaxial filter, I thought that
> > there was one on the Groups site but for some reason cant seem to locate
> > it. Any suggestions. Many thanks. Greg
> >
>

7912. Re: Looking for plot of first IF filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-02 15:34:51 UTC
From: william
Topic: 7908 Message: 7912

Hi Greg,
In the next software revision (ver16) will be a Special Test for the Cavity Filter. In the meantime, This web page shows a few plots of the Cavity Filter that is in the Verification MSA.
http://scottyspectrumanalyzer.com/special_cavitytest.html
Scotty

--- In spectrumanalyzer@yahoogroups.com, Greg Broburg <semiflex@...> wrote:
>
> Just looking for a plot of the finished coaxial filter, I thought that
> there was one on the Groups site but for some reason cant seem to locate
> it. Any suggestions. Many thanks. Greg
>

7913. Re: Looking for plot of first IF filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-02 17:15:12 UTC
From: Greg Broburg
Topic: 7908 Message: 7913

ok, thanks.

Greg

On 4/2/2011 9:34 AM, william wrote:
>
> Hi Greg,
> In the next software revision (ver16) will be a Special Test for the
> Cavity Filter. In the meantime, This web page shows a few plots of the
> Cavity Filter that is in the Verification MSA.
> http://scottyspectrumanalyzer.com/special_cavitytest.html
> Scotty
>

7914. Re: Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-03 14:23:40 UTC
From: b767_fan
Topic: 7882 Message: 7914

Thought I would let you all know that fixing the two very small cracks on the bottom solder joints made all the difference in the world, and the cavity filter works as expected.

--- In spectrumanalyzer@yahoogroups.com, "SFC" <sf-cillari@...> wrote:

7915. New beta software

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-03 19:10:31 UTC
From: Sam
Topic: 7915 Message: 7915

I have uploaded the file MSA_version116_4i_Beta.zip to the Files section. It contains the latest beta software. There are various new features since the last version. Most notably, it now supports the various automated switches with USB as well as the parallel interface. I need to get feedback from anyone who has the hardware set up with USB interface and automated switches (video filter, transmit/receive, forward/reverse or 1G/2G)

Some refinements have been made to RLC Analysis and to the method for describing OSL standards. You should delete your old MSA_Info/OperatingCal/CalSets folder before using this version.

I have also totally rewritten the RLC Analysis documentation on my web site.

A nifty new feature is "MouseOver". If you click on the graph area and hold the button (left) down, info is displayed about the graphs at the frequency where you click, and the info changes as you slide the mouse around, as long as you hold down the left button. You can place a marker while using MouseOver by pressing a key on the keyboard--the numbers 1-6 or the L or R keys (without the shift key). If the Smith chart is open, it will also display info about the graph at that frequency. Among other things, this is a handy way to check things like impedance or equivalent RC or RL circuits without having to actually change the data being graphed, because the Smith chart displays a whole list of data for the selected frequency.

You can also do MouseOver directly on the Smith chart, but the results may not be quite what you expect. Info will be displayed about the point on the chart where the mouse is located, without any regard to the actual graph data. This is more for exploring the Smith chart than it is for analyzing a specific graph.

Scotty recently mentioned the cavity filter test in the Special Tests window, which has been in the last few beta versions. This lets see the cavity filer response profile so you can tune the cavity filter without having to do any rearrangement of cables.

I am still working on a glitch in Auto Wait. With my setup, it works well with the Narrow and XNarrow filters, but goes too fast with the Mid filter.

My plan is to wait for feedback on this beta and then to finalize this version, without adding any more significant features.

Sam W.

7916. Re: Cavity filter tuning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-03 23:42:54 UTC
From: Sam
Topic: 7882 Message: 7916

Good to know the problem is solved. I can see how that increased insertion loss, but it is a bit of a surprise that it increased the leakage of out-of-band signals. But it is what it is.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "b767_fan" <b767_fan@...> wrote:
>
> Thought I would let you all know that fixing the two very small cracks on the bottom solder joints made all the difference in the world, and the cavity filter works as expected.
>
> --- In spectrumanalyzer@yahoogroups.com, "SFC" <sf-cillari@> wrote:
>

7917. The fixed attenuator configuration

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-06 02:02:46 UTC
From: inlinebeginner
Topic: 7917 Message: 7917

Sam
There are two kinds of fixed attenuator on the 'MSA collection' PCB, the schematic shows many configurations, which configurations do you recommend for those two attenuator small PCBs? (actually 3, 2 are identical).
Thanks
Lin

7918. Re: The fixed attenuator configuration

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-06 12:48:04 UTC
From: Sam
Topic: 7917 Message: 7918

The longer board is essentially two attenuators in series and is best for large attenuation values--20 dB and above. Below that the shorter board works well and is more convenient.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> There are two kinds of fixed attenuator on the 'MSA collection' PCB, the schematic shows many configurations, which configurations do you recommend for those two attenuator small PCBs? (actually 3, 2 are identical).
> Thanks
> Lin
>

7919. Re: The fixed attenuator configuration

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-06 16:40:42 UTC
From: inlinebeginner
Topic: 7917 Message: 7919

Thanks.
Lin
--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> The longer board is essentially two attenuators in series and is best for large attenuation values--20 dB and above. Below that the shorter board works well and is more convenient.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Sam
> > There are two kinds of fixed attenuator on the 'MSA collection' PCB, the schematic shows many configurations, which configurations do you recommend for those two attenuator small PCBs? (actually 3, 2 are identical).
> > Thanks
> > Lin
> >
>

7921. Active Reflection Bridge Build/Test Results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-07 12:29:22 UTC
From: lh1907
Topic: 7921 Message: 7921

I just completed build of Active Reflection Bridge. See the build photos in Larry_W2HHV album. The ActBridge_CapsInstalled pic shows the [4.7, 1, and 0.1] uF outlined in different colors. I installed all these caps first which made it easier to find install location for remaining components. Only change to this "first step" I would recommend is to not install C12 until after installing D1. Size wise, D1 is like a pea next to a boulder. Tweezer prong would not fit between two parts when D1 was installed second. C12 is taller and should be easier to install after D1. Using x-acto blade point and a lot of tedious poking, located the first D1 lead for solder tacking to PCB pad. The ActBridgePackaged pic is the first packaging step. The "support wall" for coax interfaces will be replaced with "SMA only" connector interfaces after the MSA/TG Front End Amplifiers and 10 dB attenuators are built and added. Without these accurate 50 ohm Reflect Input/DUT Response interfaces, the Act Bridge return loss was 36 dB at HF with a 51 ohm resistor connected to DUT test leads. Only document typo is 4.7 uF ac coupling capacitor Ref Des at DUT Response Output should be C11 (as shown on PCB silk screen). The following pretest steps are an approach to verifying build before installing ICs (U1, U2, and U3). 1.Measure all resistor values on PCB except R2 and R3. 2. Install U3 (78L05AC), apply +12 vdc In, and verify +5 vdc at pins 7 and 8 of U1 and U2. Confirm 2.5 vdc at U1-3 to show R2 and R3 values are the same. 3. Install U1, apply +12 vdc In, and 20 mv pk-pk Reflect Input signal and verify correct output at U1-6. 4. Install U2, apply +12 vdc In, and 20 mv pk-pk Reflect Input signal and verify correct output at DUT Response Output connector. The 47 nH inductor ordered for the 180 MHz filter at LFCN-575D, F1 position was too small. I used the air solenoid inductance calculator at (http://w7zoi.net/coils_zoi.zip) to wind an inductor on a 6-32 screw, back out coil from screw, and add a epoxy drop to coil. Tin wire leads before winding coil. Larry, W2HHV

7922. Re: Active Reflection Bridge Build/Test Results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-07 14:15:56 UTC
From: Sam
Topic: 7921 Message: 7922

Good work. You appear to be very organized. I see your point on D1. It is a tiny little demon. You input return loss of 36 dB sounds about right for 100 MHz. It should be above 50 dB at 1 MHz (depending on the accuracy of R1), but neither the input nor output return loss are very important for use as a bridge--only the DUT port return loss is important. If you want to use the bridge as a buffer amp, then those other return losses might become important. Generally, any port that leads to the MSA does not matter but the port that leads to the DUT does matter. Even a 6 dB attenuator at the DUT connection port would raise the return loss from very good to excellent. Here are two more tests to add: 1. Directivity test. Attach an accurate 50 ohm load to the DUT port. For this purpose, you could use a 0.1 % 49.9 ohm resistor to ground, soldered directly to the DUT port. Run a signal to the bridge input and record the bridge output. The output should be at least 50 dB below the input. (Directivity is the input level (dB) minus the output level (dB), or the dB value of the ratio of input voltage to output voltage.) 2. Open/Short test. Run a signal to the bridge input and record the output, with nothing attached to the DUT port. This is the Open response. Then repeat after shorting the DUT port to ground. This is the Short response. The magnitude of the Open and Short responses should be nearly identical--virtually indistinguishable at 100 kHz to a deviation of no more than 0.2 dB at 100 MHz. If you want to experiment, you can adjust Ct (1 pf) in 0.5 pf increments while performing the directivity test, to maximize the directivity at 100 MHz. Sam W. --- In spectrumanalyzer@yahoogroups.com, "lh1907" wrote: > > > I just completed build of Active Reflection Bridge. See the build photos in Larry_W2HHV album. The ActBridge_CapsInstalled pic shows the [4.7, 1, and 0.1] uF outlined in different colors. I installed all these caps first which made it easier to find install location for remaining components. Only change to this "first step" I would recommend is to not install C12 until after installing D1. Size wise, D1 is like a pea next to a boulder. Tweezer prong would not fit between two parts when D1 was installed second. C12 is taller and should be easier to install after D1. Using x-acto blade point and a lot of tedious poking, located the first D1 lead for solder tacking to PCB pad. The ActBridgePackaged pic is the first packaging step. The "support wall" for coax interfaces will be replaced with "SMA only" connector interfaces after the MSA/TG Front End Amplifiers and 10 dB attenuators are built and added. Without these accurate 50 ohm Reflect Input/DUT Response interfaces, the Act Bridge return loss was 36 dB at HF with a 51 ohm resistor connected to DUT test leads. > > Only document typo is 4.7 uF ac coupling capacitor Ref Des at DUT Response Output should be C11 (as shown on PCB silk screen). > > The following pretest steps are an approach to verifying build before installing ICs (U1, U2, and U3). > > 1.Measure all resistor values on PCB except R2 and R3. > > 2. Install U3 (78L05AC), apply +12 vdc In, and verify +5 vdc at pins 7 and 8 of U1 and U2. Confirm 2.5 vdc at U1-3 to show R2 and R3 values are the same. > > 3. Install U1, apply +12 vdc In, and 20 mv pk-pk Reflect Input signal and verify correct output at U1-6. > > 4. Install U2, apply +12 vdc In, and 20 mv pk-pk Reflect Input signal and verify correct output at DUT Response Output connector. > > The 47 nH inductor ordered for the 180 MHz filter at LFCN-575D, F1 position was too small. I used the air solenoid inductance calculator at (http://w7zoi.net/coils_zoi.zip) to wind an inductor on a 6-32 screw, back out coil from screw, and add a epoxy drop to coil. Tin wire leads before winding coil. > > Larry, W2HHV >

7923. RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-07 15:18:28 UTC
From: Clive
Topic: 7923 Message: 7923

Hi If anyone needs some RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm I have some on eBay Item number: 220765995743.

Thanks and 73 Clive GW0PPO

7924. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-08 01:12:53 UTC
From: davidhooau
Topic: 7837 Message: 7924

Hi Sam and other VGA users,

I've retested with RBW filters in place, and I'm happy the expanded log system is working correctly (and that I understand it). With the 600Hz filter, I'm getting close to 118dB range before the LD starts to plateau.

Before I nail it all shut, should I replace the VGA output transformer with a 3:1 Z ratio unit to improve the output matching?

Thanks,

davidh

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Hi Sam,
>
> Yes, I'm using the 500kHz noise filter we were tuning a few days ago.
>
> I've posted a slightly clearer graph, including the LD alone, with some additional samples to clarify things. Now, at the upper limit between 0dBm and 5dBm, you can see the slope increase as we run out of AGC range, and then the LD run out of range, making the 10dBm sample look better than it really is.
>
> For reference, the minimum AGC gain is now 7dB, the NF is 500kHz wide with an insertion loss of 4dB. The net division ratio from LD to VDBS is 0.68 and the ADC is connected per your current drawing (between the 2k7 and 10k-27k on the AGC unit).
>
> I'm going to have to put testing off for a couple of weeks, as I have a road trip for work.
>
> Cheers,
>
> davidh
>
>
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > David,
> > The only purpose of looking at the high end is to see whether there is some problem with the module that might also affect the low end, and we don't seem to have found any such problem. So maybe the abrupt flattening at the low end is due to the lack of shielding, as you originally suggested.
> >
> > If you try adjusting VMag, you'll find that your efforts are largely defeated by the

feedback loop. For example, lowering VMag lowers the VGA gain, reducing the log amp input and therefore the feedback voltage. The lower feedback voltage increases the VGA gain, partially cancelling the effect of the original lowering of VMag. You get a similar effect if you adjust the feedback ratio.
> >
> > I suggest that you put the fencing and lid on the log detector, which is where shielding is the most important, and then check the low end response.
> >
> > I've been assuming you have the noise filter in place. Is it the 500 kHz filter? Perhaps the only difference between your response and that in my paper is the noise filter width. I used 150 kHz. In my MSA I am using 500 kHz. I did not directly test the response of the Expanded Log Detector with that wider filter, but it did not seem to affect the lowest detectable signal level at the MSA input. Possibly the Expanded Log Detector's low end response would be extended with a narrower filter, but that extra range is not reachable with my narrowest RBW filter, which is now 2 kHz. Maybe a narrower noise filter would be useful when I install my 600 kHz amplifilter. If so, I'll have to reconsider using the switchable noise filter, which would allow a wide noise filter for all RBW's except the narrowest one, where a much narrower one would kick in.
> >
> > As a rough calculation, if you input to the MSA a signal of -115 dBm and have losses of 20 dB by the time you reach the IF2 amp, the signal is -135 dBm at that point, -107 dBm at the output of the 28 dB amp, and perhaps -110 dBm at the output of the RBW filter. At that point the signal will be accompanied by noise from the amp (say, -174 dBm/Hz plus 4 created by the amp plus 28 due to amplification) equal to -142 dBm/Hz. With a 2 kHz RBW filter with 3 dB loss, that is -142+36-3=-109 dBm of noise, accompanying the -110 dBm signal. The signal would still be discernible, but there would any point in the Expanded Log Detector maintaining a strong response below the -109 dBm noise level, which is about where yours (and maybe mine) peters out. A narrower noise filter would therefore not be of much benefit. With a 600 Hz RBW filter, the noise level would be reduced by 5 dB, so a narrower noise filter might increase the low end range by 5 dB. Maybe not worth the effort.
> >
> > (Note that a detector that dies below -110 dBm can still detect a -112 dBm signal if the signal is accompanied by enough noise to push the total signal+noise over -110 dBm. The noise actually provides some benefit! The detector needs a range that extends down to the noise level, but the actual detectable signal will extend below the detector's nominal range.)
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> > >
> > > Hi Sam,
> > >
> > > To use an American expression, I've thrown you a curve ball.
> > >
> > > When I plot more samples and look closely at the raw data, I'm only in the "linear" range up until 0dBm input, which is pretty close to VDBS being 1.5V.
> > >
> > > At +5dBm I'm reading about 2dB high at the LD output, as the slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB with my AGC/LD combination.
> > >

> > > At 10dBm input limiting is taking place, I'm guessing as the AD8330 runs out of puff, and it just happens that this 10dBm sample is approximately in the same line as the data between -40 and 0dBm. If I'd gathered more samples in the first graph, this would have been much clearer. (memo to self...)
> > >
> > > I'll adjust VMAG to get the overall AGC gain range correct (15-65dB) and check that my system now functions per your paper.
> > >
> > > Many thanks for your help with this.
> > >
> > > davidh
> > >
> > >
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >
> > > > David,
> > > > Your numbers seem correct. What confuses me is how you can get such a good response with inputs up to 10 dBm.
> > > >
> > > > Per p. 16 of the data sheet, with VMag=1.2 and a load of 200 ohms, the max voltage swing at the AD8330 output is +/-1.4V. At the transformer secondary, this would be halved to +/-0.7V. That is 7 dBm. With a gain of 6.8 dB, the AD8330 should start saturating with an input of 0.2 dBm. There would still be increased output with increased input (the output starts to square, but the fundamental content will still increase), but the response should start to flatten at 0.2 dBm input. Your response seems very linear well beyond that.
> > > >
> > > > It seems odd to be worried about the circuit functioning too well at high input levels, but I wonder whether that is connected with the low end not extending as far as it should.
> > > >
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> > > > >
> > > > > Sam,
> > > > >
> > > > > Wilco on the 2k7, and yes, I have 10k/27k giving an overall P of 0.68.
> > > > >
> > > > > May I again check the VGA levels with you?
> > > > >
> > > > > Looking only at voltage levels, with VDBS > 1.5V:
> > > > >
> > > > > > input xfmr: Av=4
> > > > > > loss due to 3k9: Av=0.8
> > > > > > VGA: Av=1
> > > > > > Vmag: Av=2.4
> > > > > > output resistors: Av=0.57
> > > > > > output transformer: Av=0.5
> > > > >

> > > > > This gives me an overall gain (50R to 50R) of 2.188 or 6.8dB, which is exactly what I've measured.
> > > > >
> > > > > What am I missing?
> > > > >
> > > > > Thanks,
> > > > >
> > > > > davidh
> > > > >
> > > >
> >
>

7926. Re: RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-08 10:41:01 UTC
From: Clive
Topic: 7923 Message: 7926

Hi if anyone wants some of this RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm I have one more lot of 2.4Metres left I have put it on eBay Item number: 220766420326.

I was surprised how quick this went, so it might be an idea to check it out before it's all gone!

Good luck and 73 Clive GW0PPO

--- In spectrumanalyzer@yahoogroups.com, "Clive" <clivejenner@...> wrote:
>
> Hi If anyone needs some RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm I have some on eBay Item number: 220765995743.
>
> Thanks and 73 Clive GW0PPO
>

7927. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-08 12:19:23 UTC
From: Sam
Topic: 7837 Message: 7927

It would be interesting to see what effect that has, but I doubt it will affect your range significantly, and it may actually reduce the range. Efficiency of power transfer is not a big issue at the VGA output (recall that I actually put an attenuator on the noise filter), so perfect impedance matching is not necessary.
Sam W.

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7928. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-08 12:42:46 UTC
From: Sam
Topic: 7837 Message: 7928

I should add that range of 118 dB is pretty darn good. If you want to see how far you can push it, you could try a narrower noise filter. If you have a second (wider) RBW filter, you could temporarily use that as a noise filter as an experiment.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
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7929. Re: RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-08 12:48:18 UTC
From: lh1907
Topic: 7923 Message: 7929

In May 2010, Brad Thompson had some
Belden Conformable (tm) 50-Ohm Coaxial Cable p/n 1671A.

His price per foot was very reasonable. Query Brad directly for current availablilty at brad.thompson(@)valley.net

Remove parenthesis from above before using: replace (@) with @

Larry, W2HHV

--- In spectrumanalyzer@yahoogroups.com, "Clive" <clivejenner@...> wrote:
>
> Hi if anyone wants some of this RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm I have one more lot of 2.4Metres left I have put it on eBay Item number: 220766420326.
>
> I was surprised how quick this went, so it might be an idea to check it out before it's all gone!
>
> Good luck and 73 Clive GW0PPO
>
> --- In spectrumanalyzer@yahoogroups.com, "Clive" <clivejenner@> wrote:
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> > Hi If anyone needs some RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm I have some on eBay Item number: 220765995743.
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7930. Re: [spectrumanalyzer] Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-08 13:22:44 UTC
From: Jurgen
Topic: 7837 Message: 7930

Davidh,

What does LD plateaus mean?

Jurgen

On 4/8/2011 8:19 AM, Sam wrote:
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> will affect your range significantly, and it may actually reduce the
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> > > > > > > Looking only at voltage levels, with VDBS > 1.5V:
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> > > > > > > > input xfmr: Av=4
> > > > > > > > loss due to 3k9: Av=0.8
> > > > > > > > VGA: Av=1
> > > > > > > > Vmag: Av=2.4
> > > > > > > > output resistors: Av=0.57
> > > > > > > > output transformer: Av=0.5
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> > > > > > > This gives me an overall gain (50R to 50R) of 2.188 or
> 6.8dB, which is exactly what I've measured.
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```
> > > > > > > What am I missing?
> > > > > > >
> > > > > > > Thanks,
> > > > > > >
> > > > > > > davidh
> > > > > > >
> > > > > >
> > > > >
> > >
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>
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7931. Re: [spectrumanalyzer] Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-08 13:27:49 UTC
From: Jurgen
Topic: 7837 Message: 7931

David one more question,
What is your linearity within this range?

Jurgen

On 4/8/2011 8:19 AM, Sam wrote:
>
> It would be interesting to see what effect that has, but I doubt it
> will affect your range significantly, and it may actually reduce the
> range. Efficiency of power transfer is not a big issue at the VGA
> output (recall that I actually put an attenuator on the noise filter),
> so perfect impedance matching is not necessary.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau" <dhooke@...>
> wrote:
> >
> > Hi Sam and other VGA users,
> >
> > I've retested with RBW filters in place, and I'm happy the expanded
> log system is working correctly (and that I understand it). With the
> 600Hz filter, I'm getting close to 118dB range before the LD starts to
> plateau.
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> > Before I nail it all shut, should I replace the VGA output
> transformer with a 3:1 Z ratio unit to improve the output matching?
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> > Thanks,
> >
> > davidh
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> >
> >
> > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau" <dhooke@> wrote:
> > >
> > > Hi Sam,
> > >
> > > Yes, I'm using the 500kHz noise filter we were tuning a few days ago.
> > >
> > > I've posted a slightly clearer graph, including the LD alone, with
> some additional samples to clarify things. Now, at the upper limit
> between 0dBm and 5dBm, you can see the slope increase as we run out of
> AGC range, and then the LD run out of range, making the 10dBm sample

> look better than it really is.
> > >
> > > For reference, the minimum AGC gain is now 7dB, the NF is 500kHz
> wide with an insertion loss of 4dB. The net division ratio from LD to
> VDBS is 0.68 and the ADC is connected per your current drawing
> (between the 2k7 and 10k-27k on the AGC unit).
> > >
> > > I'm going to have to put testing off for a couple of weeks, as I
> have a road trip for work.
> > >
> > > Cheers,
> > >
> > > davidh
> > >
> > >
> > >
> > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
> > > >
> > > > David,
> > > > The only purpose of looking at the high end is to see whether
> there is some problem with the module that might also affect the low
> end, and we don't seem to have found any such problem. So maybe the
> abrupt flattening at the low end is due to the lack of shielding, as
> you originally suggested.
> > > >
> > > > If you try adjusting VMag, you'll find that your efforts are
> largely defeated by the feedback loop. For example, lowering VMag
> lowers the VGA gain, reducing the log amp input and therefore the
> feedback voltage. The lower feedback voltage increases the VGA gain,
> partially cancelling the effect of the original lowering of VMag. You
> get a similar effect if you adjust the feedback ratio.
> > > >
> > > > I suggest that you put the fencing and lid on the log detector,
> which is where shielding is the most important, and then check the low
> end response.
> > > >
> > > > I've been assuming you have the noise filter in place. Is it the
> 500 kHz filter? Perhaps the only difference between your response and
> that in my paper is the noise filter width. I used 150 kHz. In my MSA
> I am using 500 kHz. I did not directly test the response of the
> Expanded Log Detector with that wider filter, but it did not seem to
> affect the lowest detectable signal level at the MSA input. Possibly
> the Expanded Log Detector's low end response would be extended with a
> narrower filter, but that extra range is not reachable with my
> narrowest RBW filter, which is now 2 kHz. Maybe a narrower noise
> filter would be useful when I install my 600 kHz amplifilter. If so,
> I'll have to reconsider using the switchable noise filter, which would
> allow a wide noise filter for all RBW's except the narrowest one,
> where a much narrower one would kick in.

> > > >
> > > > As a rough calculation, if you input to the MSA a signal of -115
> dBm and have losses of 20 dB by the time you reach the IF2 amp, the
> signal is -135 dBm at that point, -107 dBm at the output of the 28 dB
> amp, and perhaps -110 dBm at the output of the RBW filter. At that
> point the signal will be accompanied by noise from the amp (say, -174
> dBm/Hz plus 4 created by the amp plus 28 due to amplification) equal
> to -142 dBm/Hz. With a 2 kHz RBW filter with 3 dB loss, that is
> -142+36-3=-109 dBm of noise, accompanying the -110 dBm signal. The
> signal would still be discernible, but there would any point in the
> Expanded Log Detector maintaining a strong response below the -109 dBm
> noise level, which is about where yours (and maybe mine) peters out. A
> narrower noise filter would therefore not be of much benefit. With a
> 600 Hz RBW filter, the noise level would be reduced by 5 dB, so a
> narrower noise filter might increase the low end range by 5 dB. Maybe
> not worth the effort.
> > > >
> > > > (Note that a detector that dies below -110 dBm can still detect
> a -112 dBm signal if the signal is accompanied by enough noise to push
> the total signal+noise over -110 dBm. The noise actually provides some
> benefit! The detector needs a range that extends down to the noise
> level, but the actual detectable signal will extend below the
> detector's nominal range.)
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> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau" <dhooke@> wrote:
> > > > >
> > > > > Hi Sam,
> > > > >
> > > > > To use an American expression, I've thrown you a curve ball.
> > > > >
> > > > > When I plot more samples and look closely at the raw data, I'm
> only in the "linear" range up until 0dBm input, which is pretty close
> to VDBS being 1.5V.
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> > > > > At +5dBm I'm reading about 2dB high at the LD output, as the
> slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB with my
> AGC/LD combination.
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> > > > > At 10dBm input limiting is taking place, I'm guessing as the
> AD8330 runs out of puff, and it just happens that this 10dBm sample is
> approximately in the same line as the data between -40 and 0dBm. If
> I'd gathered more samples in the first graph, this would have been
> much clearer. (memo to self...)
> > > > >
> > > > > I'll adjust VMAG to get the overall AGC gain range correct
> (15-65dB) and check that my system now functions per your paper.
> > > > >

> > > > > Many thanks for your help with this.
> > > > >
> > > > > davidh
> > > > >
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> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
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> > > > > > David,
> > > > > > Your numbers seem correct. What confuses me is how you can
> get such a good response with inputs up to 10 dBm.
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> > > > > > Per p. 16 of the data sheet, with VMag=1.2 and a load of 200
> ohms, the max voltage swing at the AD8330 output is +/-1.4V. At the
> transformer secondary, this would be halved to +/-0.7V. That is 7 dBm.
> With a gain of 6.8 dB, the AD8330 should start saturating with an
> input of 0.2 dBm. There would still be increased output with increased
> input (the output starts to square, but the fundamental content will
> still increase), but the response should start to flatten at 0.2 dBm
> input. Your response seems very linear well beyond that.
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> > > > > > It seems odd to be worried about the circuit functioning too
> well at high input levels, but I wonder whether that is connected with
> the low end not extending as far as it should.
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> > > > > > > Sam,
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> > > > > > > Wilco on the 2k7, and yes, I have 10k/27k giving an
> overall P of 0.68.
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> 6.8dB, which is exactly what I've measured.
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> > > > > > > What am I missing?
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> > >
>
>

7932. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-08 13:29:57 UTC
From: Sam
Topic: 7837 Message: 7932

Log Detector response flattens out, at high and low end.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> Davidh,
>
> What does LD plateaus mean?
>
> Jurgen
>
> On 4/8/2011 8:19 AM, Sam wrote:
> >
> > It would be interesting to see what effect that has, but I doubt it
> > will affect your range significantly, and it may actually reduce the
> > range. Efficiency of power transfer is not a big issue at the VGA
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> > Sam W.
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> > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau" <dhooke@>
> > wrote:
> > >
> > > Hi Sam and other VGA users,
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> > 600Hz filter, I'm getting close to 118dB range before the LD starts to
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> > > Before I nail it all shut, should I replace the VGA output
> > transformer with a 3:1 Z ratio unit to improve the output matching?
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> > > davidh
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> > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau" <dhooke@> wrote:
> > > >
> > > > Hi Sam,
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> > AGC range, and then the LD run out of range, making the 10dBm sample
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> > > > davidh
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> > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
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> > > > > David,
> > > > > The only purpose of looking at the high end is to see whether
> > there is some problem with the module that might also affect the low
> > end, and we don't seem to have found any such problem. So maybe the
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> > > > > If you try adjusting VMag, you'll find that your efforts are
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> > > > > > > Per p. 16 of the data sheet, with VMag=1.2 and a load of 200
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> > > > > > > It seems odd to be worried about the circuit functioning too
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>

7933. Re: [spectrumanalyzer] Re: RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-08 13:56:56 UTC
From: Robert Fish
Topic: 7923 Message: 7933

Hi Guys,

I purchased some the conformable coax that Brad was selling (1671A). It is good cable at a great price. The only trouble with it is there doesn't seem to be a connector that fits it.
Brad said he couldn't find a suitable connector to go with it. However, it works great for Scotty's direct connection method. It has the shield that looks like it has been dipped in solder and it is very flexible. The shield won't peal back like a banana. You have to score it and break it off. It has a teflon dialectic so it is heat resistant. I just measured the outside diameter at .085". (I still have some).
He had a bunch of it a couple of years ago, I wouldn't be surprised if he still had some.

Hope this is of some help,

Bob K6GGO

> In May 2010, Brad Thompson had some
> Belden Conformable (tm) 50-Ohm Coaxial Cable p/n 1671A.
>
> His price per foot was very reasonable. Query Brad directly for
> current availablilty at
> brad.thompson(@)valley.net
>
> Remove parenthesis from above before using: replace (@) with @
>
> Larry, W2HHV
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Clive" <clivejenner@...>
> wrote:
> >
> > Hi if anyone wants some of this RF Coaxial Semi-Rigid Cable Flexible
> RG402 .141" 50 Ohm I have one more lot of 2.4Metres left I have put it
> on eBay Item number: 220766420326.
> >
> > I was surprised how quick this went, so it might be an idea to check
> it out before it's all gone!
> >
> > Good luck and 73 Clive GW0PPO
> >
> > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Clive" <clivejenner@> wrote:
> > >

> > > Hi If anyone needs some RF Coaxial Semi-Rigid Cable Flexible RG402
> .141" 50 Ohm I have some on eBay Item number: 220765995743.
> > >
> > > Thanks and 73 Clive GW0PPO
> > >
> >
>
>

7934. Re: RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-08 15:02:21 UTC
From: Sam
Topic: 7923 Message: 7934

Bob,
That's the tin-dipped shield version of RG-405 "hardline" (i.e. the copper tube shield), sometimes described as 0.085" and sometimes 0.086". You can use the same connectors used for the hardline. I have assembled plenty of those. You don't want to peel back the shield, you want to insert it into the connector and then solder the connector to the outside of the shield, like soldering copper plumbing pipe to a coupler.

To remove the end of the shield, I use a wire cutter (the type that has several slots for different wire sizes), apply a little pressure and rotate around the cable. I then use the same wire cutter to cut the teflon, first with an oversize cutter slot, and then with one that fits the center wire. Then check to be sure there is not a stray strand from the shield wrapped over the end that might cause a short.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Robert Fish <rwfish@...> wrote:
>
> Hi Guys,
>
> I purchased some the conformable coax that Brad was selling (1671A). It
> is good cable at a great price. The only trouble with it is there
> doesn't seem to be a connector that fits it.
> Brad said he couldn't find a suitable connector to go with it. However,
> it works great for Scotty's direct connection method. It has the shield
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> The shield won't peal back like a banana. You have to score it and break
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> He had a bunch of it a couple of years ago, I wouldn't be surprised if
> he still had some.
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> Hope this is of some help,
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> > > >
> > > > Hi If anyone needs some RF Coaxial Semi-Rigid Cable Flexible RG402
> > .141" 50 Ohm I have some on eBay Item number: 220765995743.
> > > >
> > > > Thanks and 73 Clive GW0PPO
> > > >
> > >
> >
> >
>

7935. Re: [spectrumanalyzer] RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-08 15:10:31 UTC
From: William Dillon
Topic: 7923 Message: 7935

I've been using Brad's coax for a while also. I've had success with these connectors:

Digi-key link

Also, I've got some instructions for installing them on my blog:

http://alternet.us.com/?page_id=843 (scroll to the bottom)

Finally, I've purchased from him recently (and referred him to someone that purchased in the last year), I think he's still got plenty.

- Will

On Apr 8, 2011, at 6:56 AM, Robert Fish wrote:

> Hi Guys,
>
> I purchased some the conformable coax that Brad was selling (1671A). It is good cable at a great price. The only trouble with it is there doesn't seem to be a connector that fits it.
> Brad said he couldn't find a suitable connector to go with it. However, it works great for Scotty's direct connection method. It has the shield that looks like it has been dipped in solder and it is very flexible.
> The shield won't peal back like a banana. You have to score it and break it off. It has a teflon dialectic so it is heat resistant. I just measured the outside diameter at .085". (I still have some).
> He had a bunch of it a couple of years ago, I wouldn't be surprised if he still had some.
>
> Hope this is of some help,
>
> Bob K6GGO
>
>>
>> In May 2010, Brad Thompson had some
>> Belden Conformable (tm) 50-Ohm Coaxial Cable p/n 1671A.
>>
>> His price per foot was very reasonable. Query Brad directly for current availablilty at
>> brad.thompson(@)valley.net
>>
>> Remove parenthesis from above before using: replace (@) with @
>>
>> Larry, W2HHV
>>
>> --- In spectrumanalyzer@yahoogroups.com, "Clive" <clivejenner@...> wrote:
>> >

>> > Hi if anyone wants some of this RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm I have one more lot of 2.4Metres left I have put it on eBay Item number: 220766420326.
>> >
>> > I was surprised how quick this went, so it might be an idea to check it out before it's all gone!
>> >
>> > Good luck and 73 Clive GW0PPO
>> >
>> > --- In spectrumanalyzer@yahoogroups.com, "Clive" <clivejenner@> wrote:
>> > >
>> > > Hi If anyone needs some RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm I have some on eBay Item number: 220765995743.
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>> >
>>
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>
>

7936. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-09 07:13:24 UTC
From: davidhooau
Topic: 7837 Message: 7936

Hi Jurgen,

I saw very similar results to those shown in Sam's paper. I'm going to play a few more testing games, and then I'll get some results graphed to more definitively answer your (and my own) question.

As expected, the was a big improvement using an RBW filter at the input, compared with my earlier tests without. I only have the 600Hz amplifilter working at the moment but expect to add additional filters in the next few week.

HTH.

davidh

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> David one more question,
> What is your linearity within this range?
>
> Jurgen
>
> On 4/8/2011 8:19 AM, Sam wrote:
> >
> > It would be interesting to see what effect that has, but I doubt it
> > will affect your range significantly, and it may actually reduce the
> > range. Efficiency of power transfer is not a big issue at the VGA
> > output (recall that I actually put an attenuator on the noise filter),
> > so perfect impedance matching is not necessary.
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau" <dhooke@>
> > wrote:
> > >
> > > Hi Sam and other VGA users,
> > >
> > > I've retested with RBW filters in place, and I'm happy the expanded
> > log system is working correctly (and that I understand it). With the
> > 600Hz filter, I'm getting close to 118dB range before the LD starts to
> > plateau.
> > >
> > > Before I nail it all shut, should I replace the VGA output
> > transformer with a 3:1 Z ratio unit to improve the output matching?
> > >
> > > Thanks,
> > >

> > > davidh
> > >
> > >
> > >
> > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau" <dhooke@> wrote:
> > > >
> > > > Hi Sam,
> > > >
> > > > Yes, I'm using the 500kHz noise filter we were tuning a few days ago.
> > > >
> > > > I've posted a slightly clearer graph, including the LD alone, with
> > some additional samples to clarify things. Now, at the upper limit
> > between 0dBm and 5dBm, you can see the slope increase as we run out of
> > AGC range, and then the LD run out of range, making the 10dBm sample
> > look better than it really is.
> > > >
> > > > For reference, the minimum AGC gain is now 7dB, the NF is 500kHz
> > wide with an insertion loss of 4dB. The net division ratio from LD to
> > VDBS is 0.68 and the ADC is connected per your current drawing
> > (between the 2k7 and 10k-27k on the AGC unit).
> > > >
> > > > I'm going to have to put testing off for a couple of weeks, as I
> > have a road trip for work.
> > > >
> > > > Cheers,
> > > >
> > > > davidh
> > > >
> > > >
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
> > > > >
> > > > > David,
> > > > > The only purpose of looking at the high end is to see whether
> > there is some problem with the module that might also affect the low
> > end, and we don't seem to have found any such problem. So maybe the
> > abrupt flattening at the low end is due to the lack of shielding, as
> > you originally suggested.
> > > > >
> > > > > If you try adjusting VMag, you'll find that your efforts are
> > largely defeated by the feedback loop. For example, lowering VMag
> > lowers the VGA gain, reducing the log amp input and therefore the
> > feedback voltage. The lower feedback voltage increases the VGA gain,
> > partially cancelling the effect of the original lowering of VMag. You
> > get a similar effect if you adjust the feedback ratio.
> > > > >
> > > > > I suggest that you put the fencing and lid on the log detector,
> > which is where shielding is the most important, and then check the low

> > end response.
> > > > >
> > > > > I've been assuming you have the noise filter in place. Is it the
> > 500 kHz filter? Perhaps the only difference between your response and
> > that in my paper is the noise filter width. I used 150 kHz. In my MSA
> > I am using 500 kHz. I did not directly test the response of the
> > Expanded Log Detector with that wider filter, but it did not seem to
> > affect the lowest detectable signal level at the MSA input. Possibly
> > the Expanded Log Detector's low end response would be extended with a
> > narrower filter, but that extra range is not reachable with my
> > narrowest RBW filter, which is now 2 kHz. Maybe a narrower noise
> > filter would be useful when I install my 600 kHz amplifilter. If so,
> > I'll have to reconsider using the switchable noise filter, which would
> > allow a wide noise filter for all RBW's except the narrowest one,
> > where a much narrower one would kick in.
> > > > >
> > > > > As a rough calculation, if you input to the MSA a signal of -115
> > dBm and have losses of 20 dB by the time you reach the IF2 amp, the
> > signal is -135 dBm at that point, -107 dBm at the output of the 28 dB
> > amp, and perhaps -110 dBm at the output of the RBW filter. At that
> > point the signal will be accompanied by noise from the amp (say, -174
> > dBm/Hz plus 4 created by the amp plus 28 due to amplification) equal
> > to -142 dBm/Hz. With a 2 kHz RBW filter with 3 dB loss, that is
> > -142+36-3=-109 dBm of noise, accompanying the -110 dBm signal. The
> > signal would still be discernible, but there would any point in the
> > Expanded Log Detector maintaining a strong response below the -109 dBm
> > noise level, which is about where yours (and maybe mine) peters out. A
> > narrower noise filter would therefore not be of much benefit. With a
> > 600 Hz RBW filter, the noise level would be reduced by 5 dB, so a
> > narrower noise filter might increase the low end range by 5 dB. Maybe
> > not worth the effort.
> > > > >
> > > > > (Note that a detector that dies below -110 dBm can still detect
> > a -112 dBm signal if the signal is accompanied by enough noise to push
> > the total signal+noise over -110 dBm. The noise actually provides some
> > benefit! The detector needs a range that extends down to the noise
> > level, but the actual detectable signal will extend below the
> > detector's nominal range.)
> > > > >
> > > > > Sam W.
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau" <dhooke@> wrote:
> > > > > >
> > > > > > Hi Sam,
> > > > > >
> > > > > > To use an American expression, I've thrown you a curve ball.
> > > > > >
> > > > > > When I plot more samples and look closely at the raw data, I'm
> > only in the "linear" range up until 0dBm input, which is pretty close

> > to VDBS being 1.5V.
> > > > > >
> > > > > > At +5dBm I'm reading about 2dB high at the LD output, as the
> > slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB with my
> > AGC/LD combination.
> > > > > >
> > > > > > At 10dBm input limiting is taking place, I'm guessing as the
> > AD8330 runs out of puff, and it just happens that this 10dBm sample is
> > approximately in the same line as the data between -40 and 0dBm. If
> > I'd gathered more samples in the first graph, this would have been
> > much clearer. (memo to self...)
> > > > > >
> > > > > > I'll adjust VMAG to get the overall AGC gain range correct
> > (15-65dB) and check that my system now functions per your paper.
> > > > > >
> > > > > > Many thanks for your help with this.
> > > > > >
> > > > > > davidh
> > > > > >
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> > > > > > --- In spectrumanalyzer@yahoogroups.com
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> > > > > > > David,
> > > > > > > Your numbers seem correct. What confuses me is how you can
> > get such a good response with inputs up to 10 dBm.
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> > > > > > > Per p. 16 of the data sheet, with VMag=1.2 and a load of 200
> > ohms, the max voltage swing at the AD8330 output is +/-1.4V. At the
> > transformer secondary, this would be halved to +/-0.7V. That is 7 dBm.
> > With a gain of 6.8 dB, the AD8330 should start saturating with an
> > input of 0.2 dBm. There would still be increased output with increased
> > input (the output starts to square, but the fundamental content will
> > still increase), but the response should start to flatten at 0.2 dBm
> > input. Your response seems very linear well beyond that.
> > > > > > >
> > > > > > > It seems odd to be worried about the circuit functioning too
> > well at high input levels, but I wonder whether that is connected with
> > the low end not extending as far as it should.
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> > > > > > > Sam W.
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> > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau" <dhooke@> wrote:
> > > > > > > >
> > > > > > > > Sam,
> > > > > > > >
> > > > > > > > Wilco on the 2k7, and yes, I have 10k/27k giving an
> > overall P of 0.68.

> > > > > > > >
> > > > > > > > May I again check the VGA levels with you?
> > > > > > > >
> > > > > > > > Looking only at voltage levels, with VDBS > 1.5V:
> > > > > > > >
> > > > > > > > > input xfmr: Av=4
> > > > > > > > > loss due to 3k9: Av=0.8
> > > > > > > > > VGA: Av=1
> > > > > > > > > Vmag: Av=2.4
> > > > > > > > > output resistors: Av=0.57
> > > > > > > > > output transformer: Av=0.5
> > > > > > > >
> > > > > > > > This gives me an overall gain (50R to 50R) of 2.188 or
> > 6.8dB, which is exactly what I've measured.
> > > > > > > >
> > > > > > > > What am I missing?
> > > > > > > >
> > > > > > > > Thanks,
> > > > > > > >
> > > > > > > > davidh
> > > > > > >
> > > > > >
> > > > >
> > > >
> > >
> >
>

7937. Testing Crystal filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-09 07:19:29 UTC
From: davidhooau
Topic: 7937 Message: 7937

Folks,

This question will demonstrate how inexperienced with RF design I am....

I have a couple of crystal filters (3.7kHz and 28kHz) for which I have no data. I'm planning to use the MSA component meter mode with a series fixture to determine the impedances to match to.

How should I terminate the unused port of the filter as I test (open, short, actual impedance as measured....)?

Thanks,

davidh

7938. Re: [spectrumanalyzer] Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-09 12:07:02 UTC
From: Jurgen
Topic: 7837 Message: 7938

Hello David,

Thanks for your reply. I logged about 14 different test combination in
an Excel spread sheet and it looks like that one is stuck with a certain
max linear range of about 110 dB in this circuit. No matter what I tried
could not get past it.
I thought the there was a possibility to expand the top end but ran into
limitations.
I finally settled for this result. I am using a 500 kHz ceramic filter
within the chain.

Jurgen

On 4/9/2011 3:13 AM, davidhooau wrote:
>
> Hi Jurgen,
>
> I saw very similar results to those shown in Sam's paper. I'm going to
> play a few more testing games, and then I'll get some results graphed
> to more definitively answer your (and my own) question.
>
> As expected, the was a big improvement using an RBW filter at the
> input, compared with my earlier tests without. I only have the 600Hz
> amplifilter working at the moment but expect to add additional filters
> in the next few week.
>
> HTH.
>
> davidh
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@...> wrote:
> >
> > David one more question,
> > What is your linearity within this range?
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> > Jurgen
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> > On 4/8/2011 8:19 AM, Sam wrote:
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> > > It would be interesting to see what effect that has, but I doubt it
> > > will affect your range significantly, and it may actually reduce the
> > > range. Efficiency of power transfer is not a big issue at the VGA
> > > output (recall that I actually put an attenuator on the noise
> filter),
> > > so perfect impedance matching is not necessary.

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> > > --- In spectrumanalyzer@yahoogroups.com
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> > > > Hi Sam and other VGA users,
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> > > > I've retested with RBW filters in place, and I'm happy the expanded
> > > log system is working correctly (and that I understand it). With the
> > > 600Hz filter, I'm getting close to 118dB range before the LD
> starts to
> > > plateau.
> > > >
> > > > Before I nail it all shut, should I replace the VGA output
> > > transformer with a 3:1 Z ratio unit to improve the output matching?
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> > > > Thanks,
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> > > > davidh
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> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>
> > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> <dhooke@> wrote:
> > > > >
> > > > > Hi Sam,
> > > > >
> > > > > Yes, I'm using the 500kHz noise filter we were tuning a few
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> > > > > For reference, the minimum AGC gain is now 7dB, the NF is 500kHz
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> > > VDBS is 0.68 and the ADC is connected per your current drawing
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> > > > > > As a rough calculation, if you input to the MSA a signal of
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> > > dBm and have losses of 20 dB by the time you reach the IF2 amp, the
> > > signal is -135 dBm at that point, -107 dBm at the output of the 28 dB

> > > amp, and perhaps -110 dBm at the output of the RBW filter. At that
> > > point the signal will be accompanied by noise from the amp (say, -174
> > > dBm/Hz plus 4 created by the amp plus 28 due to amplification) equal
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> > > benefit! The detector needs a range that extends down to the noise
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> > > > > > > Hi Sam,
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> > > > > > > > > > May I again check the VGA levels with you?

> > > > > > > > >
> > > > > > > > > > Looking only at voltage levels, with VDBS > 1.5V:
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> > > > > > > > > > > input xfmr: Av=4
> > > > > > > > > > > loss due to 3k9: Av=0.8
> > > > > > > > > > > VGA: Av=1
> > > > > > > > > > > Vmag: Av=2.4
> > > > > > > > > > > output resistors: Av=0.57
> > > > > > > > > > > output transformer: Av=0.5
> > > > > > > > > >
> > > > > > > > > > > This gives me an overall gain (50R to 50R) of 2.188 or
> > > 6.8dB, which is exactly what I've measured.
> > > > > > > > > >
> > > > > > > > > > > What am I missing?
> > > > > > > > > >
> > > > > > > > > > > Thanks,
> > > > > > > > > >
> > > > > > > > > > > davidh
> > > > > > > > >
> > > > > > > >
> > > > > > >
> > > > > >
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>

7939. Re: Testing Crystal filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-09 13:30:32 UTC
From: Sam
Topic: 7937 Message: 7939

That is a tricky issue. The filter output has to be terminated with the complex conjugate of its output impedance, which you don't know because that is what you are trying to find out.

The solution is in the Two Port module of the software, if you use the beta software:

1. In reflection mode, calibrate and perform a reflection mode scan that covers about 5 times the filter's bandwidth, with 200-400 steps. If you are using a series fixture with good on-board attenuation, you can use Reference calibration--no need for full OSL.
2. Change to transmission mode, calibrate and do one scan. (The reflection data is no longer graphed but still exists.
3. Open the Two Port module under the Two Port menu.
4. It asks you what to do with the data. Tell it to transfer the reflection data to both S11 and S22, and the transmission data to S21 and S12. A graph of the data will be shown, showing the performance of the filter with 50 ohm source and load. If you select the S21 graph, it will look bad.
5. Click Change Terminations, which opens a window that lets you see the performance with other terminations.
6. Click Auto Match, specifying Simultaneous match. This will calculate the source and load impedances that create the desired conjugate match on both input and output, and will take into account the circular complication that the value of the load impedance will affect the desired source impedance.
7. It will also show the components that create the desired impedance, and you have the choice of several configurations. If you change the configuration, re-click Auto Match.
8. You can click a button for a parameter to graph it, showing the response with the calculated termination. You want to confirm that S21 looks good.

Matching components are calculated as though you are using a transformer to do the resistive match, with an inductor or capacitor adjacent to the filter to provide the desired reactance. The configuration you probably want is a shunt capacitor on input and output. You then calculate (with RFSim99) the impedance matching circuit to transform the impedance from 50 to the resistance calculated by Auto Match, in the form of a series Inductor followed by a shunt capacitor at the filter input. At the output, the capacitor will come before the inductor, so in both cases the RFSim-calculated capacitor is adjacent to the filter, as is the AutoMatch-calculated capacitor. You just combine the adjacent capacitors into one by adding them together (even if one has a negative value).

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Folks,
>
> This question will demonstrate how inexperienced with RF design I am....
>
> I have a couple of crystal filters (3.7kHz and 28kHz) for which I have no data. I'm

planning to use the MSA component meter mode with a series fixture to determine the impedances to match to.
>
> How should I terminate the unused port of the filter as I test (open, short, actual impedance as measured....)?
>
> Thanks,
>
> davidh
>

7940. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-09 13:35:01 UTC
From: Sam
Topic: 7837 Message: 7940

Jurgen,
The main potential for greater range is the use of very narrow RBW filters and/or a narrow noise filter. I would expect that the combination of an RBW filter below 1 kHz with a noise filter of 7.5 kHz would improve the low end. That would of course require using a switchable noise filter, though as an experiment you could manually swap the noise filters. I have not tried these narrow filters.
Sam W.

--- In spectrumanalyzer@...m, Jurgen <khj221@...> wrote:
>
> Hello David,
>
> Thanks for your reply. I logged about 14 different test combination in
> an Excel spread sheet and it looks like that one is stuck with a certain
> max linear range of about 110 dB in this circuit. No matter what I tried
> could not get past it.
> I thought the there was a possibility to expand the top end but ran into
> limitations.
> I finally settled for this result. I am using a 500 kHz ceramic filter
> within the chain.
>
> Jurgen
>
>
>
> On 4/9/2011 3:13 AM, davidhooau wrote:
> >
> > Hi Jurgen,
> >
> > I saw very similar results to those shown in Sam's paper. I'm going to
> > play a few more testing games, and then I'll get some results graphed
> > to more definitively answer your (and my own) question.
> >
> > As expected, the was a big improvement using an RBW filter at the
> > input, compared with my earlier tests without. I only have the 600Hz
> > amplifilter working at the moment but expect to add additional filters
> > in the next few week.
> >
> > HTH.
> >
> > davidh
> >
> > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@> wrote:
> > >

> > > David one more question,
> > > What is your linearity within this range?
> > >
> > > Jurgen
> > >
> > > On 4/8/2011 8:19 AM, Sam wrote:
> > > >
> > > > It would be interesting to see what effect that has, but I doubt it
> > > > will affect your range significantly, and it may actually reduce the
> > > > range. Efficiency of power transfer is not a big issue at the VGA
> > > > output (recall that I actually put an attenuator on the noise
> > filter),
> > > > so perfect impedance matching is not necessary.
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau" <dhooke@>
> > > > wrote:
> > > > >
> > > > > Hi Sam and other VGA users,
> > > > >
> > > > > I've retested with RBW filters in place, and I'm happy the expanded
> > > > log system is working correctly (and that I understand it). With the
> > > > 600Hz filter, I'm getting close to 118dB range before the LD
> > starts to
> > > > plateau.
> > > > >
> > > > > Before I nail it all shut, should I replace the VGA output
> > > > transformer with a 3:1 Z ratio unit to improve the output matching?
> > > > >
> > > > > Thanks,
> > > > >
> > > > > davidh
> > > > >
> > > > >
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > <dhooke@> wrote:
> > > > > >
> > > > > > Hi Sam,
> > > > > >
> > > > > > Yes, I'm using the 500kHz noise filter we were tuning a few
> > days ago.
> > > > > >
> > > > > > I've posted a slightly clearer graph, including the LD alone,
> > with
> > > > some additional samples to clarify things. Now, at the upper limit

> > > > between 0dBm and 5dBm, you can see the slope increase as we run
> > out of
> > > > AGC range, and then the LD run out of range, making the 10dBm sample
> > > > look better than it really is.
> > > > > >
> > > > > > For reference, the minimum AGC gain is now 7dB, the NF is 500kHz
> > > > wide with an insertion loss of 4dB. The net division ratio from LD to
> > > > VDBS is 0.68 and the ADC is connected per your current drawing
> > > > (between the 2k7 and 10k-27k on the AGC unit).
> > > > > >
> > > > > > I'm going to have to put testing off for a couple of weeks, as I
> > > > have a road trip for work.
> > > > > >
> > > > > > Cheers,
> > > > > >
> > > > > > davidh
> > > > > >
> > > > > >
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@>
> > wrote:
> > > > > > >
> > > > > > > David,
> > > > > > > The only purpose of looking at the high end is to see whether
> > > > there is some problem with the module that might also affect the low
> > > > end, and we don't seem to have found any such problem. So maybe the
> > > > abrupt flattening at the low end is due to the lack of shielding, as
> > > > you originally suggested.
> > > > > > >
> > > > > > > If you try adjusting VMag, you'll find that your efforts are
> > > > largely defeated by the feedback loop. For example, lowering VMag
> > > > lowers the VGA gain, reducing the log amp input and therefore the
> > > > feedback voltage. The lower feedback voltage increases the VGA gain,
> > > > partially cancelling the effect of the original lowering of VMag. You
> > > > get a similar effect if you adjust the feedback ratio.
> > > > > > >
> > > > > > > I suggest that you put the fencing and lid on the log detector,
> > > > which is where shielding is the most important, and then check the
> > low
> > > > end response.
> > > > > > >
> > > > > > > I've been assuming you have the noise filter in place. Is it
> > the
> > > > 500 kHz filter? Perhaps the only difference between your response and
> > > > that in my paper is the noise filter width. I used 150 kHz. In my MSA
> > > > I am using 500 kHz. I did not directly test the response of the
> > > > Expanded Log Detector with that wider filter, but it did not seem to
> > > > affect the lowest detectable signal level at the MSA input. Possibly

> > > > the Expanded Log Detector's low end response would be extended with a
> > > > narrower filter, but that extra range is not reachable with my
> > > > narrowest RBW filter, which is now 2 kHz. Maybe a narrower noise
> > > > filter would be useful when I install my 600 kHz amplifilter. If so,
> > > > I'll have to reconsider using the switchable noise filter, which
> > would
> > > > allow a wide noise filter for all RBW's except the narrowest one,
> > > > where a much narrower one would kick in.
> > > > > > >
> > > > > > > > As a rough calculation, if you input to the MSA a signal of
> > -115
> > > > dBm and have losses of 20 dB by the time you reach the IF2 amp, the
> > > > signal is -135 dBm at that point, -107 dBm at the output of the 28 dB
> > > > amp, and perhaps -110 dBm at the output of the RBW filter. At that
> > > > point the signal will be accompanied by noise from the amp (say, -174
> > > > dBm/Hz plus 4 created by the amp plus 28 due to amplification) equal
> > > > to -142 dBm/Hz. With a 2 kHz RBW filter with 3 dB loss, that is
> > > > -142+36-3=-109 dBm of noise, accompanying the -110 dBm signal. The
> > > > signal would still be discernible, but there would any point in the
> > > > Expanded Log Detector maintaining a strong response below the -109
> > dBm
> > > > noise level, which is about where yours (and maybe mine) peters
> > out. A
> > > > narrower noise filter would therefore not be of much benefit. With a
> > > > 600 Hz RBW filter, the noise level would be reduced by 5 dB, so a
> > > > narrower noise filter might increase the low end range by 5 dB. Maybe
> > > > not worth the effort.
> > > > > > >
> > > > > > > > (Note that a detector that dies below -110 dBm can still detect
> > > > a -112 dBm signal if the signal is accompanied by enough noise to
> > push
> > > > the total signal+noise over -110 dBm. The noise actually provides
> > some
> > > > benefit! The detector needs a range that extends down to the noise
> > > > level, but the actual detectable signal will extend below the
> > > > detector's nominal range.)
> > > > > > >
> > > > > > > > Sam W.
> > > > > > >
> > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > <dhooke@> wrote:
> > > > > > >
> > > > > > > > Hi Sam,
> > > > > > >
> > > > > > > > To use an American expression, I've thrown you a curve ball.
> > > > > > >
> > > > > > > > When I plot more samples and look closely at the raw data,
> > I'm

> > > > only in the "linear" range up until 0dBm input, which is pretty close
> > > > to VDBS being 1.5V.
> > > > > > > >
> > > > > > > > At +5dBm I'm reading about 2dB high at the LD output, as the
> > > > slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB with my
> > > > AGC/LD combination.
> > > > > > > >
> > > > > > > > At 10dBm input limiting is taking place, I'm guessing as the
> > > > AD8330 runs out of puff, and it just happens that this 10dBm
> > sample is
> > > > approximately in the same line as the data between -40 and 0dBm. If
> > > > I'd gathered more samples in the first graph, this would have been
> > > > much clearer. (memo to self...)
> > > > > > > >
> > > > > > > > I'll adjust VMAG to get the overall AGC gain range correct
> > > > (15-65dB) and check that my system now functions per your paper.
> > > > > > > >
> > > > > > > > Many thanks for your help with this.
> > > > > > > >
> > > > > > > > davidh
> > > > > > > >
> > > > > > > >
> > > > > > > >
> > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@>
> > wrote:
> > > > > > > >
> > > > > > > > David,
> > > > > > > > Your numbers seem correct. What confuses me is how you can
> > > > get such a good response with inputs up to 10 dBm.
> > > > > > > >
> > > > > > > > Per p. 16 of the data sheet, with VMag=1.2 and a load of
> > 200
> > > > ohms, the max voltage swing at the AD8330 output is +/-1.4V. At the
> > > > transformer secondary, this would be halved to +/-0.7V. That is 7
> > dBm.
> > > > With a gain of 6.8 dB, the AD8330 should start saturating with an
> > > > input of 0.2 dBm. There would still be increased output with
> > increased
> > > > input (the output starts to square, but the fundamental content will
> > > > still increase), but the response should start to flatten at 0.2 dBm
> > > > input. Your response seems very linear well beyond that.
> > > > > > > >
> > > > > > > > It seems odd to be worried about the circuit functioning
> > too
> > > > well at high input levels, but I wonder whether that is connected
> > with
> > > > the low end not extending as far as it should.
> > > > > > > >

> > > > > > > > > Sam W.
> > > > > > > > >
> > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > <dhooke@> wrote:
> > > > > > > > > >
> > > > > > > > > > Sam,
> > > > > > > > > >
> > > > > > > > > > Wilco on the 2k7, and yes, I have 10k/27k giving an
> > > > overall P of 0.68.
> > > > > > > > > >
> > > > > > > > > > May I again check the VGA levels with you?
> > > > > > > > >
> > > > > > > > > > Looking only at voltage levels, with VDBS > 1.5V:
> > > > > > > > >
> > > > > > > > > > input xfmr: Av=4
> > > > > > > > > > loss due to 3k9: Av=0.8
> > > > > > > > > > VGA: Av=1
> > > > > > > > > > Vmag: Av=2.4
> > > > > > > > > > output resistors: Av=0.57
> > > > > > > > > > output transformer: Av=0.5
> > > > > > > > >
> > > > > > > > > > This gives me an overall gain (50R to 50R) of 2.188 or
> > > > 6.8dB, which is exactly what I've measured.
> > > > > > > > >
> > > > > > > > > > What am I missing?
> > > > > > > > >
> > > > > > > > > > Thanks,
> > > > > > > > >
> > > > > > > > > > davidh
> > > > > > > > >
> > > > > > > >
> > > > > > >
> > > > > >
> > > > >
> > > >
> > >
> >
>

7941. Re: [spectrumanalyzer] Re: RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-09 15:35:16 UTC
From: Robert Fish
Topic: 7923 Message: 7941

Hi Guys,

That is great news. Now I can use this stuff for jumpers. I don't know where I got it in my head that there were no connectors for that cable. I think I read it somewhere.
I have to admit when I measured it at .085" I thought to myself," thats a standard size, hard to believe there's no connectors made for that". Obviosly I never checked.

At any rate, now I can make better use of the stuff, and that's a good thing.

Thanks,

Bob

> Bob,
> That's the tin-dipped shield version of RG-405 "hardline" (i.e. the
> copper tube shield), sometimes described as 0.085" and sometimes
> 0.086". You can use the same connectors used for the hardline. I have
> assembled plenty of those. You don't want to peel back the shield, you
> want to insert it into the connector and then solder the connector to
> the outside of the shield, like soldering copper plumbing pipe to a
> coupler.
>
> To remove the end of the shield, I use a wire cutter (the type that
> has several slots for different wire sizes), apply a little pressure
> and rotate around the cable. I then use the same wire cutter to cut
> the teflon, first with an oversize cutter slot, and then with one that
> fits the center wire. Then check to be sure there is not a stray
> strand from the shield wrapped over the end that might cause a short.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Robert Fish <rwfish@...>
> wrote:
>

7942. Re: [spectrumanalyzer] Re: RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-09 15:48:43 UTC
From: Robert Cerreto
Topic: 7923 Message: 7942

There are plenty of oriental SMA knockoffs that will fit 0.085 cables. Try surfing EBAY. I do not remember where I got mine. There are some good old expensive USA connectors too. Unless I am using the wrong ones!!!

73, Bob WA!FXT

--- On Fri, 4/8/11, Robert Fish <rwfish@...> wrote:

From: Robert Fish <rwfish@...>
Subject: Re: [spectrumanalyzer] Re: RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm
To: spectrumanalyzer@yahoogroups.com
Cc: "lh1907" <llh5@...>
Date: Friday, April 8, 2011, 9:56 AM

Hi Guys,

I purchased some the conformable coax that Brad was selling (1671A). It is good cable at a great price. The only trouble with it is there doesn't seem to be a connector that fits it.

Brad said he couldn't find a suitable connector to go with it. However, it works great for Scotty's direct connection method. It has the shield that looks like it has been dipped in solder and it is very flexible.

The shield won't peal back like a banana. You have to score it and break it off. It has a teflon dialectic so it is heat resistant. I just measured the outside diameter at .085". (I still have some).

He had a bunch of it a couple of years ago, I wouldn't be surprised if he still had some.

Hope this is of some help,

Bob K6GGO

In May 2010, Brad Thompson had some

Belden Conformable (tm) 50-Ohm Coaxial Cable p/n 1671A.

His price per foot was very reasonable. Query Brad directly for current availablilty at

brad.thompson(@)valley.net

Remove parenthesis from above before using: replace (@) with @

Larry, W2HHV

--- In spectrumanalyzer@yahoogroups.com,
"Clive" <clivejenner@...> wrote:

>

> Hi if anyone wants some of this RF Coaxial Semi-Rigid
Cable Flexible RG402 .141" 50 Ohm I have one more lot of
2.4Metres left I have put it on eBay Item number:
220766420326.

>

> I was surprised how quick this went, so it might be
an idea to check it out before it's all gone!

>

> Good luck and 73 Clive GW0PPO

>

> --- In spectrumanalyzer@yahoogroups.com,
"Clive" <clivejenner@> wrote:

> >

> > Hi If anyone needs some RF Coaxial Semi-Rigid
Cable Flexible RG402 .141" 50 Ohm I have some on eBay Item
number: 220765995743.

> >

> > Thanks and 73 Clive GW0PPO

> >

>

7943. Re: [spectrumanalyzer] Re: RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-09 15:54:18 UTC
From: Robert Cerreto
Topic: 7923 Message: 7943

Other Bob,

Sam is correct. Another way to strip it is to score the shield with a SHARP razor knife while "rolling" the cable on your bench. You will "feel" when you have cut through the shield. You can then just pull it off. I find this bit easier than the pipe cutter approach. But, I have arthritic hands.

GL, Bob WA!FXT

--- On Fri, 4/8/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: RF Coaxial Semi-Rigid Cable Flexible RG402 .141" 50 Ohm
To: spectrumanalyzer@yahoogroups.com
Date: Friday, April 8, 2011, 11:02 AM

Bob,

That's the tin-dipped shield version of RG-405 "hardline" (i.e. the copper tube shield), sometimes described as 0.085" and sometimes 0.086". You can use the same connectors used for the hardline. I have assembled plenty of those. You don't want to peel back the shield, you want to insert it into the connector and then solder the connector to the outside of the shield, like soldering copper plumbing pipe to a coupler.

To remove the end of the shield, I use a wire cutter (the type that has several slots for different wire sizes), apply a little pressure and rotate around the cable. I then use the same wire cutter to cut the teflon, first with an oversize cutter slot, and then with one that fits the center wire. Then check to be sure there is not a stray strand from the shield wrapped over the end that might cause a short.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Robert Fish <rwfish@...> wrote:

>

> Hi Guys,

>

> I purchased some the conformable coax that Brad was selling (1671A). It

> is good cable at a great price. The only trouble with it is there

> doesn't seem to be a connector that fits it.

> Brad said he couldn't find a suitable connector to go with it. However,

> it works great for Scotty's direct connection method. It has the shield

> that looks like it has been dipped in solder and it is very flexible.

> The shield won't peal back like a banana. You have to score it and break

> it off. It has a teflon dialectic so it is heat resistant. I just

> measured the outside diameter at .085". (I still have some).

> He had a bunch of it a couple of years ago, I wouldn't be surprised if

> he still had some.

>

> Hope this is of some help,

>

> Bob K6GGO

>

> > In May 2010, Brad Thompson had some

> > Belden Conformable (tm) 50-Ohm Coaxial Cable p/n 1671A.

> >

> > His price per foot was very reasonable. Query Brad directly for

> > current availablilty at

> > brad.thompson(@)valley.net

> >

> > Remove parenthesis from above before using: replace (@) with @

> >

> > Larry, W2HHV

> >

> > --- In spectrumanalyzer@yahoogroups.com

> > <mailto:spectrumanalyzer%40yahoogroups.com>, "Clive" <clivejenner@>

> > wrote:

> > >

> > > Hi if anyone wants some of this RF Coaxial Semi-Rigid Cable Flexible

> > RG402 .141" 50 Ohm I have one more lot of 2.4Metres left I have put it

> > on eBay Item number: 220766420326.

> > >

> > > I was surprised how quick this went, so it might be an idea to check

> > it out before it's all gone!

> > >

> > > Good luck and 73 Clive GW0PPO

> > >

> > > --- In spectrumanalyzer@yahoogroups.com

> > <mailto:spectrumanalyzer%40yahoogroups.com>, "Clive" <clivejenner@> wrote:

> > > >

> > > > Hi If anyone needs some RF Coaxial Semi-Rigid Cable Flexible RG402

> > .141" 50 Ohm I have some on eBay Item number: 220765995743.

> > > >

> > > > Thanks and 73 Clive GW0PPO

> > > >

> > >

> >

>

7944. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-09 20:54:17 UTC
From: davidhooau
Topic: 7837 Message: 7944

Hi Jurgen,

In the "davidh build" area of the photo section is a graph of the VGA system prior to using the 600Hz RBW filter. For this, the LD was shielded, the VGA and NF open.

For the LD alone, there's almost 100dB of range (-90..+10dBm). I have not plotted the errors for this test.

For the VGA system with no RBW filter, there's about an additional 10dB that is usable with good calibration (-107..+3dBm). For this range, the absolute error ranges from about +2dBm at the bottom and the top, and by adjusting the gain equation I've used, I can move the error graph downwards to better "pick" the upper and lower limits.

With the 600Hz filter and the NF and VGA shielded (no graph), the flattening of the bottom end is extended to around -115dBm, where the error term is about 2dBm. This is my (quite arbitrary) determinant of usable range.

To perform these tests, I used a sig gen and attenuator directly into the VGA or amplifilter inputs. Neither of these devices are in cal or have been accurately measured, so perhaps my system is a lot worse (or a lot better) than these tests indicate.

One thing that does come out of these tests is that I'm going to need to replace my IFA with a LN amp of some sort.

I'm in the process of shielding all of the SLIMs currently, so I'll try to get back to VGA games in the next few days. Unfortunately wo*k (sorry Scotty, I've tried to hide the word from you) gets in the way.

davidh

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> limitations.
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> > filter),
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> > > > AGC range, and then the LD run out of range, making the 10dBm sample
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> > > > VDBS is 0.68 and the ADC is connected per your current drawing
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> > > > end response.
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> > > > > > > I've been assuming you have the noise filter in place. Is it
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> > > > 500 kHz filter? Perhaps the only difference between your response and
> > > > that in my paper is the noise filter width. I used 150 kHz. In my MSA
> > > > I am using 500 kHz. I did not directly test the response of the
> > > > Expanded Log Detector with that wider filter, but it did not seem to
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> > > > > > > As a rough calculation, if you input to the MSA a signal of
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> > > > dBm and have losses of 20 dB by the time you reach the IF2 amp, the
> > > > signal is -135 dBm at that point, -107 dBm at the output of the 28 dB
> > > > amp, and perhaps -110 dBm at the output of the RBW filter. At that
> > > > point the signal will be accompanied by noise from the amp (say, -174
> > > > dBm/Hz plus 4 created by the amp plus 28 due to amplification) equal
> > > > to -142 dBm/Hz. With a 2 kHz RBW filter with 3 dB loss, that is
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> > > > > > > (Note that a detector that dies below -110 dBm can still detect
> > > > a -112 dBm signal if the signal is accompanied by enough noise to

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> > > > > > > > > > Hi Sam,
> > > > > > > > > >
> > > > > > > > > > To use an American expression, I've thrown you a curve ball.
> > > > > > > > > >
> > > > > > > > > > When I plot more samples and look closely at the raw data,
> > I'm
> > > > only in the "linear" range up until 0dBm input, which is pretty close
> > > > to VDBS being 1.5V.
> > > > > > > > > >
> > > > > > > > > > At +5dBm I'm reading about 2dB high at the LD output, as the
> > > > slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB with my
> > > > AGC/LD combination.
> > > > > > > > > >
> > > > > > > > > > At 10dBm input limiting is taking place, I'm guessing as the
> > > > AD8330 runs out of puff, and it just happens that this 10dBm
> > sample is
> > > > approximately in the same line as the data between -40 and 0dBm. If
> > > > I'd gathered more samples in the first graph, this would have been
> > > > much clearer. (memo to self...)
> > > > > > > > > >
> > > > > > > > > > I'll adjust VMAG to get the overall AGC gain range correct
> > > > (15-65dB) and check that my system now functions per your paper.
> > > > > > > > > >
> > > > > > > > > > Many thanks for your help with this.
> > > > > > > > >
> > > > > > > > > > davidh
> > > > > > > > >
> > > > > > > > >
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> > > > > > > > >
> > > > > > > > > > David,
> > > > > > > > > > Your numbers seem correct. What confuses me is how you can

> > > > get such a good response with inputs up to 10 dBm.
> > > > > > > > >
> > > > > > > > > Per p. 16 of the data sheet, with VMag=1.2 and a load of
> > 200
> > > > ohms, the max voltage swing at the AD8330 output is +/-1.4V. At the
> > > > transformer secondary, this would be halved to +/-0.7V. That is 7
> > dBm.
> > > > With a gain of 6.8 dB, the AD8330 should start saturating with an
> > > > input of 0.2 dBm. There would still be increased output with
> > increased
> > > > input (the output starts to square, but the fundamental content will
> > > > still increase), but the response should start to flatten at 0.2 dBm
> > > > input. Your response seems very linear well beyond that.
> > > > > > > > >
> > > > > > > > > It seems odd to be worried about the circuit functioning
> > too
> > > > well at high input levels, but I wonder whether that is connected
> > with
> > > > the low end not extending as far as it should.
> > > > > > > > >
> > > > > > > > > Sam W.
> > > > > > > > >
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> > > > > > > > >
> > > > > > > > > Sam,
> > > > > > > > >
> > > > > > > > > Wilco on the 2k7, and yes, I have 10k/27k giving an
> > > > overall P of 0.68.
> > > > > > > > >
> > > > > > > > > May I again check the VGA levels with you?
> > > > > > > > >
> > > > > > > > > Looking only at voltage levels, with VDBS > 1.5V:
> > > > > > > > >
> > > > > > > > > > input xfmr: Av=4
> > > > > > > > > > loss due to 3k9: Av=0.8
> > > > > > > > > > VGA: Av=1
> > > > > > > > > > Vmag: Av=2.4
> > > > > > > > > > output resistors: Av=0.57
> > > > > > > > > > output transformer: Av=0.5
> > > > > > > > >
> > > > > > > > > This gives me an overall gain (50R to 50R) of 2.188 or
> > > > 6.8dB, which is exactly what I've measured.
> > > > > > > > >
> > > > > > > > > What am I missing?
> > > > > > > > >
> > > > > > > > > Thanks,
> > > > > > > > >

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> > > > > > > > > > > davidh
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7945. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-09 21:45:43 UTC
From: Sam
Topic: 7837 Message: 7945

This brings up a good point about how you determine the low end. As you lower the signal level, the response, in ADC value per dB, eventually starts to fall. When it gets too small, you are out of range, but there is no precise level of "too small". A good guideline is that when the ADC changes less than 10 for a change of 1 dB, it will be difficult to make use of that response. Another way to do it is to use the initial calibration procedure with the largest video filter and click Measure repeatedly at input of, say, -111 dBm, and then do the same with -110 dBm. If the ADC readings for -110 dBm are consistently higher than those for -111 dBm, then you can consider -110 dBm to be within the usable range.

A graphical way to do it is to scan a narrow range around, say, 5 MHz, with the largest video filter, inputting a low level signal. At very low levels, the signal will show a small bump, whose exact shape will change from sweep to sweep due to noise. But if you can consistently see that the bump is there, you can consider that signal level to be within the usable range. The smallest such signal is the Minimum Visible Signal.

The accuracy of measurements of the very lowest level signals will not be great, due to noise. Measurement of the Minimum Visible Signal as determined above may be off by several dB. But in many cases your only concern at such levels is whether the signal is even there, and determining its precise level is not critical.

At one point, I determined that my Minimum Visible signal with a 2 KHz RBW filter was -113 dBm (at the MSA input), even though I could distinguish (barely) -124 dBm from -125 dBm if I took enough readings and averaged the ADC values.

Interestingly, the useful range in VNA modes extends a bit below the Minimum Visible Signal, because you unconsciously perform your own visual averaging. If you look at a filter response dropping slowly below the Minimum Visible Signal, noise may cause it to make erratic up and down movements, but the downward trend may still be clear. This may give you more than 5 dB of additional range.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Hi Jurgen,
>
> In the "davidh build" area of the photo section is a graph of the VGA system prior to using the 600Hz RBW filter. For this, the LD was shielded, the VGA and NF open.
>
> For the LD alone, there's almost 100dB of range (-90..+10dBm). I have not plotted the errors for this test.
>
> For the VGA system with no RBW filter, there's about an additional 10dB that is usable with good calibration (-107..+3dBm). For this range, the absolute error ranges from about +2dBm at the bottom and the top, and by adjusting the gain equation I've used, I can move the error graph downwards to better "pick" the upper and lower limits.

>
> With the 600Hz filter and the NF and VGA shielded (no graph), the flattening of the bottom end is extended to around -115dBm, where the error term is about 2dBm. This is my (quite arbitrary) determinant of usable range.
>
> To perform these tests, I used a sig gen and attenuator directly into the VGA or amplifilter inputs. Neither of these devices are in cal or have been accurately measured, so perhaps my system is a lot worse (or a lot better) than these tests indicate.
>
> One thing that does come out of these tests is that I'm going to need to replace my IFA with a LN amp of some sort.
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> I'm in the process of shielding all of the SLIMs currently, so I'll try to get back to VGA games in the next few days. Unfortunately wo*k (sorry Scotty, I've tried to hide the word from you) gets in the way.
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> > > > > > > > > When I plot more samples and look closely at the raw data,
> > > I'm
> > > > > only in the "linear" range up until 0dBm input, which is pretty close
> > > > > to VDBS being 1.5V.
> > > > > > > > >
> > > > > > > > > At +5dBm I'm reading about 2dB high at the LD output, as the
> > > > > slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB with my
> > > > > AGC/LD combination.
> > > > > > > > >
> > > > > > > > > At 10dBm input limiting is taking place, I'm guessing as the
> > > > > AD8330 runs out of puff, and it just happens that this 10dBm
> > > sample is
> > > > > approximately in the same line as the data between -40 and 0dBm. If
> > > > > I'd gathered more samples in the first graph, this would have been
> > > > > much clearer. (memo to self...)
> > > > > > > > >
> > > > > > > > > I'll adjust VMAG to get the overall AGC gain range correct
> > > > > (15-65dB) and check that my system now functions per your paper.
> > > > > > > > >
> > > > > > > > > Many thanks for your help with this.
> > > > > > > > >
> > > > > > > > > davidh
> > > > > > > > >
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> > > > > > > > > Per p. 16 of the data sheet, with VMag=1.2 and a load of
> > > 200
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> > > dBm.
> > > > > With a gain of 6.8 dB, the AD8330 should start saturating with an
> > > > > input of 0.2 dBm. There would still be increased output with
> > > increased
> > > > > input (the output starts to square, but the fundamental content will
> > > > > still increase), but the response should start to flatten at 0.2 dBm
> > > > > input. Your response seems very linear well beyond that.
> > > > > > > > >

> > > > > > > > > > It seems odd to be worried about the circuit functioning
> > > too
> > > > > well at high input levels, but I wonder whether that is connected
> > > with
> > > > > the low end not extending as far as it should.
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> > > > > > > > > > > Sam W.
> > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > <mailto:spectrumanalyzer%40yahoogroups.com>
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> > > <dhooke@> wrote:
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> > > > > > > > > > > > Sam,
> > > > > > > > > > >
> > > > > > > > > > > > Wilco on the 2k7, and yes, I have 10k/27k giving an
> > > > > overall P of 0.68.
> > > > > > > > > > >
> > > > > > > > > > > > May I again check the VGA levels with you?
> > > > > > > > > >
> > > > > > > > > > > > Looking only at voltage levels, with VDBS > 1.5V:
> > > > > > > > > >
> > > > > > > > > > > > input xfmr: Av=4
> > > > > > > > > > > > loss due to 3k9: Av=0.8
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> > > > > > > > > > > > Vmag: Av=2.4
> > > > > > > > > > > > output resistors: Av=0.57
> > > > > > > > > > > > output transformer: Av=0.5
> > > > > > > > > >
> > > > > > > > > > > > This gives me an overall gain (50R to 50R) of 2.188 or
> > > > > 6.8dB, which is exactly what I've measured.
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> > > > > > > > > > > > Thanks,
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7946. Re: [spectrumanalyzer] Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-10 12:39:33 UTC
From: Jurgen
Topic: 7837 Message: 7946

Sam,

Are you talking about the filter bandwidth within the VGA chain?
Remember my tests include the VGA chain only.
I am just getting into it again. Work gets into the way.
I finally have my new scope going, probing etc.
I also have the PCB's I promised, the size turned out ~ 1mm larger than
the others. Don't why looks like I did not pay attention.
I will ship them soon.

Jurgen

On 4/9/2011 9:35 AM, Sam wrote:
>
> Jurgen,
> The main potential for greater range is the use of very narrow RBW
> filters and/or a narrow noise filter. I would expect that the
> combination of an RBW filter below 1 kHz with a noise filter of 7.5
> kHz would improve the low end. That would of course require using a
> switchable noise filter, though as an experiment you could manually
> swap the noise filters. I have not tried these narrow filters.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@...> wrote:
> >
> > Hello David,
> >
> > Thanks for your reply. I logged about 14 different test combination in
> > an Excel spread sheet and it looks like that one is stuck with a
> certain
> > max linear range of about 110 dB in this circuit. No matter what I
> tried
> > could not get past it.
> > I thought the there was a possibility to expand the top end but ran
> into
> > limitations.
> > I finally settled for this result. I am using a 500 kHz ceramic filter
> > within the chain.
> >
> > Jurgen
> >
> >
> >
> > On 4/9/2011 3:13 AM, davidhooau wrote:
> > >

> > > Hi Jurgen,
> > >
> > > I saw very similar results to those shown in Sam's paper. I'm
> going to
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> > > to more definitively answer your (and my own) question.
> > >
> > > As expected, the was a big improvement using an RBW filter at the
> > > input, compared with my earlier tests without. I only have the 600Hz
> > > amplifilter working at the moment but expect to add additional
> filters
> > > in the next few week.
> > >
> > > HTH.
> > >
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> > >
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> > > > Jurgen
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> > > > On 4/8/2011 8:19 AM, Sam wrote:
> > > > >
> > > > > It would be interesting to see what effect that has, but I
> doubt it
> > > > > will affect your range significantly, and it may actually
> reduce the
> > > > > range. Efficiency of power transfer is not a big issue at the VGA
> > > > > output (recall that I actually put an attenuator on the noise
> > > filter),
> > > > > so perfect impedance matching is not necessary.
> > > > > Sam W.
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>
> > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> <dhooke@>
> > > > > wrote:
> > > > > >
> > > > > > Hi Sam and other VGA users,
> > > > > >
> > > > > > I've retested with RBW filters in place, and I'm happy the
> expanded
> > > > > log system is working correctly (and that I understand it).

> With the
> > > > > 600Hz filter, I'm getting close to 118dB range before the LD
> > > starts to
> > > > > plateau.
> > > > > >
> > > > > > Before I nail it all shut, should I replace the VGA output
> > > > > transformer with a 3:1 Z ratio unit to improve the output
> matching?
> > > > > >
> > > > > > Thanks,
> > > > > >
> > > > > > davidh
> > > > > >
> > > > > >
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com
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> > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > <dhooke@> wrote:
> > > > > >
> > > > > > > Hi Sam,
> > > > > > >
> > > > > > > Yes, I'm using the 500kHz noise filter we were tuning a few
> > > days ago.
> > > > > > >
> > > > > > > I've posted a slightly clearer graph, including the LD alone,
> > > with
> > > > > some additional samples to clarify things. Now, at the upper limit
> > > > > between 0dBm and 5dBm, you can see the slope increase as we run
> > > out of
> > > > > AGC range, and then the LD run out of range, making the 10dBm
> sample
> > > > > look better than it really is.
> > > > > > >
> > > > > > > For reference, the minimum AGC gain is now 7dB, the NF is
> 500kHz
> > > > > wide with an insertion loss of 4dB. The net division ratio
> from LD to
> > > > > VDBS is 0.68 and the ADC is connected per your current drawing
> > > > > (between the 2k7 and 10k-27k on the AGC unit).
> > > > > > >
> > > > > > > I'm going to have to put testing off for a couple of
> weeks, as I
> > > > > have a road trip for work.
> > > > > > >
> > > > > > > Cheers,
> > > > > > >
> > > > > > > davidh
> > > > > > >

> > > > > > >
> > > > > > >
> > > > > > > --- In spectrumanalyzer@yahoogroups.com
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> > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@>
> > > wrote:
> > > > > > > >
> > > > > > > > > David,
> > > > > > > > > The only purpose of looking at the high end is to see
> whether
> > > > > > there is some problem with the module that might also affect
> the low
> > > > > > end, and we don't seem to have found any such problem. So
> maybe the
> > > > > > abrupt flattening at the low end is due to the lack of
> shielding, as
> > > > > > you originally suggested.
> > > > > > > > >
> > > > > > > > > > If you try adjusting VMag, you'll find that your efforts are
> > > > > > largely defeated by the feedback loop. For example, lowering VMag
> > > > > > lowers the VGA gain, reducing the log amp input and therefore the
> > > > > > feedback voltage. The lower feedback voltage increases the VGA
> gain,
> > > > > > partially cancelling the effect of the original lowering of
> VMag. You
> > > > > > get a similar effect if you adjust the feedback ratio.
> > > > > > > > >
> > > > > > > > > > I suggest that you put the fencing and lid on the log
> detector,
> > > > > > which is where shielding is the most important, and then check
> the
> > > > low
> > > > > > end response.
> > > > > > > > >
> > > > > > > > > > I've been assuming you have the noise filter in place.
> Is it
> > > > the
> > > > > > 500 kHz filter? Perhaps the only difference between your
> response and
> > > > > > that in my paper is the noise filter width. I used 150 kHz. In
> my MSA
> > > > > > I am using 500 kHz. I did not directly test the response of the
> > > > > > Expanded Log Detector with that wider filter, but it did not
> seem to
> > > > > > affect the lowest detectable signal level at the MSA input.
> Possibly
> > > > > > the Expanded Log Detector's low end response would be extended
> with a
> > > > > > narrower filter, but that extra range is not reachable with my

> > > > > narrowest RBW filter, which is now 2 kHz. Maybe a narrower noise
> > > > > filter would be useful when I install my 600 kHz amplifilter.
> If so,
> > > > > I'll have to reconsider using the switchable noise filter, which
> > > would
> > > > > allow a wide noise filter for all RBW's except the narrowest one,
> > > > > where a much narrower one would kick in.
> > > > > > > >
> > > > > > > > As a rough calculation, if you input to the MSA a signal of
> > > -115
> > > > > dBm and have losses of 20 dB by the time you reach the IF2
> amp, the
> > > > > signal is -135 dBm at that point, -107 dBm at the output of
> the 28 dB
> > > > > amp, and perhaps -110 dBm at the output of the RBW filter. At that
> > > > > point the signal will be accompanied by noise from the amp
> (say, -174
> > > > > dBm/Hz plus 4 created by the amp plus 28 due to amplification)
> equal
> > > > > to -142 dBm/Hz. With a 2 kHz RBW filter with 3 dB loss, that is
> > > > > -142+36-3=-109 dBm of noise, accompanying the -110 dBm signal. The
> > > > > signal would still be discernible, but there would any point
> in the
> > > > > Expanded Log Detector maintaining a strong response below the
> -109
> > > dBm
> > > > > noise level, which is about where yours (and maybe mine) peters
> > > out. A
> > > > > narrower noise filter would therefore not be of much benefit.
> With a
> > > > > 600 Hz RBW filter, the noise level would be reduced by 5 dB, so a
> > > > > narrower noise filter might increase the low end range by 5
> dB. Maybe
> > > > > not worth the effort.
> > > > > > > >
> > > > > > > > (Note that a detector that dies below -110 dBm can still
> detect
> > > > > a -112 dBm signal if the signal is accompanied by enough noise to
> > > push
> > > > > the total signal+noise over -110 dBm. The noise actually provides
> > > some
> > > > > benefit! The detector needs a range that extends down to the noise
> > > > > level, but the actual detectable signal will extend below the
> > > > > detector's nominal range.)
> > > > > > > >
> > > > > > > > Sam W.
> > > > > > > >
> > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>
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> > > > > > > > > > Per p. 16 of the data sheet, with VMag=1.2 and a
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7947. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-10 14:29:12 UTC
From: Sam
Topic: 7837 Message: 7947

You can't pin down the full range until you have the full chain of IF2 Amp--RBW filter--VGA--Noise Filter--Log Detector. The narrowness of the RBW filter and noise filter affects the low end range up to a point. Narrowing a filter improves the range only if that filter is the bottleneck in the noise reduction plan. To see how far you can extend the range, it is probably best to start with very narrow filters. If it turns out, for example, that very narrow filters have a range of only 5 dB more than you get with wider filters, you might decide the using the switchable noise filter is not worth the trouble.

When I did my testing, I did not have an extremely narrow RBW filter, nor did I try a noise filter narrower than 60 kHz. Now that I have the 600 Hz amplifilter, I plan to use it to replace my 2 kHz RBW filter, which I can then try as the noise filter. (The noise filter does not have anywhere near as much attenuation as the RBW filters, but an extra RBW filter is convenient to use for an experiment.)
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
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> Sam,
>
> Are you talking about the filter bandwidth within the VGA chain?
> Remember my tests include the VGA chain only.
> I am just getting into it again. Work gets into the way.
> I finally have my new scope going, probing etc.
> I also have the PCB's I promised, the size turned out ~ 1mm larger than
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> > > > > > 600Hz filter, I'm getting close to 118dB range before the LD
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> > > > > > > Before I nail it all shut, should I replace the VGA output
> > > > > > transformer with a 3:1 Z ratio unit to improve the output
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> > > > > > >
> > > > > > > Thanks,
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> > > > > > > davidh
> > > > > > >
> > > > > > >
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> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > <dhooke@> wrote:
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> > > > > > > > I've posted a slightly clearer graph, including the LD alone,
> > > > with
> > > > > > some additional samples to clarify things. Now, at the upper limit
> > > > > > between 0dBm and 5dBm, you can see the slope increase as we run

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> > > > > > AGC range, and then the LD run out of range, making the 10dBm
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> > > > > > > > For reference, the minimum AGC gain is now 7dB, the NF is
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> > > > > > end response.
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> > > > > > > I am using 500 kHz. I did not directly test the response of the
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> > > > > > > amp, and perhaps -110 dBm at the output of the RBW filter. At that
> > > > > > > point the signal will be accompanied by noise from the amp
> > (say, -174
> > > > > > > dBm/Hz plus 4 created by the amp plus 28 due to amplification)
> > equal
> > > > > > > to -142 dBm/Hz. With a 2 kHz RBW filter with 3 dB loss, that is
> > > > > > > -142+36-3=-109 dBm of noise, accompanying the -110 dBm signal. The
> > > > > > > signal would still be discernible, but there would any point
> > in the
> > > > > > > Expanded Log Detector maintaining a strong response below the
> > -109
> > > > > dBm
> > > > > > > noise level, which is about where yours (and maybe mine) peters
> > > > out. A
> > > > > > > narrower noise filter would therefore not be of much benefit.
> > With a

> > > > > > 600 Hz RBW filter, the noise level would be reduced by 5 dB, so a
> > > > > > narrower noise filter might increase the low end range by 5
> > dB. Maybe
> > > > > > not worth the effort.
> > > > > > > > >
> > > > > > > > > > (Note that a detector that dies below -110 dBm can still
> > detect
> > > > > > > a -112 dBm signal if the signal is accompanied by enough noise to
> > > > > push
> > > > > > > the total signal+noise over -110 dBm. The noise actually provides
> > > > > some
> > > > > > > benefit! The detector needs a range that extends down to the noise
> > > > > > > level, but the actual detectable signal will extend below the
> > > > > > > detector's nominal range.)
> > > > > > > > > >
> > > > > > > > > > Sam W.
> > > > > > > > > >
> > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
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> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > <dhooke@> wrote:
> > > > > > > > >
> > > > > > > > > > Hi Sam,
> > > > > > > > >
> > > > > > > > > > To use an American expression, I've thrown you a curve
> > ball.
> > > > > > > > >
> > > > > > > > > > When I plot more samples and look closely at the raw
> > data,
> > > > > I'm
> > > > > > > only in the "linear" range up until 0dBm input, which is
> > pretty close
> > > > > > to VDBS being 1.5V.
> > > > > > > > >
> > > > > > > > > > At +5dBm I'm reading about 2dB high at the LD output,
> > as the
> > > > > > slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB
> > with my
> > > > > > AGC/LD combination.
> > > > > > > > >
> > > > > > > > > > At 10dBm input limiting is taking place, I'm guessing
> > as the
> > > > > > AD8330 runs out of puff, and it just happens that this 10dBm
> > > > > sample is
> > > > > > approximately in the same line as the data between -40 and
> > 0dBm. If
> > > > > > I'd gathered more samples in the first graph, this would have been
> > > > > > much clearer. (memo to self...)
> > > > > > > > >

> > > > > > > > > > I'll adjust VMAG to get the overall AGC gain range correct
> > > > > > (15-65dB) and check that my system now functions per your paper.
> > > > > > > > > > >
> > > > > > > > > > > Many thanks for your help with this.
> > > > > > > > > > > >
> > > > > > > > > > > > davidh
> > > > > > > > > > > >
> > > > > > > > > > > >
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> > > > wrote:
> > > > > > > > > > > >
> > > > > > > > > > > > David,
> > > > > > > > > > > > Your numbers seem correct. What confuses me is how
> > you can
> > > > > > get such a good response with inputs up to 10 dBm.
> > > > > > > > > > > >
> > > > > > > > > > > > Per p. 16 of the data sheet, with VMag=1.2 and a
> > load of
> > > > > 200
> > > > > > ohms, the max voltage swing at the AD8330 output is +/-1.4V.
> > At the
> > > > > > transformer secondary, this would be halved to +/-0.7V. That is 7
> > > > dBm.
> > > > > > With a gain of 6.8 dB, the AD8330 should start saturating with an
> > > > > > input of 0.2 dBm. There would still be increased output with
> > > > increased
> > > > > > input (the output starts to square, but the fundamental
> > content will
> > > > > > still increase), but the response should start to flatten at
> > 0.2 dBm
> > > > > > input. Your response seems very linear well beyond that.
> > > > > > > > > > > >
> > > > > > > > > > > > It seems odd to be worried about the circuit
> > functioning
> > > > > too
> > > > > > well at high input levels, but I wonder whether that is connected
> > > > with
> > > > > > the low end not extending as far as it should.
> > > > > > > > > > > >
> > > > > > > > > > > > Sam W.
> > > > > > > > > > > >
> > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
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> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > <dhooke@> wrote:

> > > > > > > > > > > >
> > > > > > > > > > > > > Sam,
> > > > > > > > > > > > >
> > > > > > > > > > > > > Wilco on the 2k7, and yes, I have 10k/27k giving an
> > > > > > overall P of 0.68.
> > > > > > > > > > > > >
> > > > > > > > > > > > > May I again check the VGA levels with you?
> > > > > > > > > > > > >
> > > > > > > > > > > > > Looking only at voltage levels, with VDBS > 1.5V:
> > > > > > > > > > > > >
> > > > > > > > > > > > > > input xfmr: Av=4
> > > > > > > > > > > > > > loss due to 3k9: Av=0.8
> > > > > > > > > > > > > > VGA: Av=1
> > > > > > > > > > > > > > Vmag: Av=2.4
> > > > > > > > > > > > > > output resistors: Av=0.57
> > > > > > > > > > > > > > output transformer: Av=0.5
> > > > > > > > > > > > >
> > > > > > > > > > > > > This gives me an overall gain (50R to 50R) of 2.188 or
> > > > > > 6.8dB, which is exactly what I've measured.
> > > > > > > > > > > > >
> > > > > > > > > > > > > What am I missing?
> > > > > > > > > > > > >
> > > > > > > > > > > > > Thanks,
> > > > > > > > > > > > >
> > > > > > > > > > > > > davidh
> > > > > > > > > > > >
> > > > > > > > > > >
> > > > > > > > > >
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7948. Re: [spectrumanalyzer] Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-10 16:04:55 UTC
From: Jurgen
Topic: 7837 Message: 7948

You might remember initially I used the 60kHz ceramic filter as a noise filter then after some deliberation I changed it back to 600 kHz. According to my record this extended the low range by an additional 5dB. I am looking forward to the results of putting a 2kHz filter into its place.
Jurgen

On 4/10/2011 10:29 AM, Sam wrote:
>
> You can't pin down the full range until you have the full chain of IF2
> Amp--RBW filter--VGA--Noise Filter--Log Detector. The narrowness of
> the RBW filter and noise filter affects the low end range up to a
> point. Narrowing a filter improves the range only if that filter is
> the bottleneck in the noise reduction plan. To see how far you can
> extend the range, it is probably best to start with very narrow
> filters. If it turns out, for example, that very narrow filters have a
> range of only 5 dB more than you get with wider filters, you might
> decide the using the switchable noise filter is not worth the trouble.
>
> When I did my testing, I did not have an extremely narrow RBW filter,
> nor did I try a noise filter narrower than 60 kHz. Now that I have the
> 600 Hz amplifilter, I plan to use it to replace my 2 kHz RBW filter,
> which I can then try as the noise filter. (The noise filter does not
> have anywhere near as much attenuation as the RBW filters, but an
> extra RBW filter is convenient to use for an experiment.)
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@...> wrote:
> >
> > Sam,
> >
> > Are you talking about the filter bandwidth within the VGA chain?
> > Remember my tests include the VGA chain only.
> > I am just getting into it again. Work gets into the way.
> > I finally have my new scope going, probing etc.
> > I also have the PCB's I promised, the size turned out ~ 1mm larger than
> > the others. Don't why looks like I did not pay attention.
> > I will ship them soon.
> >
> > Jurgen
> >
> >
> >
> > On 4/9/2011 9:35 AM, Sam wrote:
> > >

> > > Jurgen,
> > > The main potential for greater range is the use of very narrow RBW
> > > filters and/or a narrow noise filter. I would expect that the
> > > combination of an RBW filter below 1 kHz with a noise filter of 7.5
> > > kHz would improve the low end. That would of course require using a
> > > switchable noise filter, though as an experiment you could manually
> > > swap the noise filters. I have not tried these narrow filters.
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>
> > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@> wrote:
> > > >
> > > > Hello David,
> > > >
> > > > Thanks for your reply. I logged about 14 different test
> combination in
> > > > an Excel spread sheet and it looks like that one is stuck with a
> > > certain
> > > > max linear range of about 110 dB in this circuit. No matter what I
> > > tried
> > > > could not get past it.
> > > > I thought the there was a possibility to expand the top end but ran
> > > into
> > > > limitations.
> > > > I finally settled for this result. I am using a 500 kHz ceramic
> filter
> > > > within the chain.
> > > >
> > > > Jurgen
> > > >
> > > >
> > > >
> > > > On 4/9/2011 3:13 AM, davidhooau wrote:
> > > > >
> > > > > Hi Jurgen,
> > > > >
> > > > > I saw very similar results to those shown in Sam's paper. I'm
> > > going to
> > > > > play a few more testing games, and then I'll get some results
> graphed
> > > > > to more definitively answer your (and my own) question.
> > > > >
> > > > > As expected, the was a big improvement using an RBW filter at the
> > > > > input, compared with my earlier tests without. I only have the
> 600Hz
> > > > > amplifilter working at the moment but expect to add additional
> > > filters
> > > > > in the next few week.
> > > > >

> > > > > HTH.
> > > > >
> > > > > davidh
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>
> > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@>
> wrote:
> > > > > >
> > > > > > David one more question,
> > > > > > What is your linearity within this range?
> > > > > >
> > > > > > Jurgen
> > > > > >
> > > > > > On 4/8/2011 8:19 AM, Sam wrote:
> > > > > > >
> > > > > > > It would be interesting to see what effect that has, but I
> > > doubt it
> > > > > > > will affect your range significantly, and it may actually
> > > reduce the
> > > > > > > range. Efficiency of power transfer is not a big issue at
> the VGA
> > > > > > > output (recall that I actually put an attenuator on the noise
> > > > > filter),
> > > > > > > so perfect impedance matching is not necessary.
> > > > > > > Sam W.
> > > > > > >
> > > > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>
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> > > > > > > > > davidh
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> > > > > > > >
> > > > > > > >
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> > > Possibly
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> > > > > > > narrower filter, but that extra range is not reachable with my
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> signal of
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> > > > > > > dBm and have losses of 20 dB by the time you reach the IF2
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> > > the 28 dB
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> At that
> > > > > > > point the signal will be accompanied by noise from the amp
> > > (say, -174
> > > > > > > dBm/Hz plus 4 created by the amp plus 28 due to
> amplification)
> > > equal
> > > > > > > to -142 dBm/Hz. With a 2 kHz RBW filter with 3 dB loss,
> that is
> > > > > > > -142+36-3=-109 dBm of noise, accompanying the -110 dBm
> signal. The
> > > > > > > signal would still be discernible, but there would any point
> > > in the
> > > > > > > Expanded Log Detector maintaining a strong response below the
> > > -109
> > > > > dBm
> > > > > > > noise level, which is about where yours (and maybe mine)
> peters
> > > > > out. A
> > > > > > > narrower noise filter would therefore not be of much benefit.
> > > With a
> > > > > > > 600 Hz RBW filter, the noise level would be reduced by 5
> dB, so a
> > > > > > > narrower noise filter might increase the low end range by 5
> > > dB. Maybe
> > > > > > > not worth the effort.

> > > > > > > > > >
> > > > > > > > > > > (Note that a detector that dies below -110 dBm can
> still
> > > detect
> > > > > > > > a -112 dBm signal if the signal is accompanied by enough
> noise to
> > > > > > push
> > > > > > > > the total signal+noise over -110 dBm. The noise actually
> provides
> > > > > > some
> > > > > > > > benefit! The detector needs a range that extends down to
> the noise
> > > > > > > > level, but the actual detectable signal will extend below the
> > > > > > > > detector's nominal range.)
> > > > > > > > > > >
> > > > > > > > > > > Sam W.
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>
> > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > <dhooke@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > Hi Sam,
> > > > > > > > > > >
> > > > > > > > > > > To use an American expression, I've thrown you a
> curve
> > > ball.
> > > > > > > > > > >
> > > > > > > > > > > When I plot more samples and look closely at the raw
> > > data,
> > > > > I'm
> > > > > > > > only in the "linear" range up until 0dBm input, which is
> > > pretty close
> > > > > > > to VDBS being 1.5V.
> > > > > > > > > > >
> > > > > > > > > > > At +5dBm I'm reading about 2dB high at the LD output,
> > > as the
> > > > > > > slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB
> > > with my
> > > > > > > AGC/LD combination.
> > > > > > > > > > >
> > > > > > > > > > > At 10dBm input limiting is taking place, I'm guessing
> > > as the
> > > > > > > AD8330 runs out of puff, and it just happens that this 10dBm
> > > > > sample is
> > > > > > > approximately in the same line as the data between -40 and
> > > 0dBm. If
> > > > > > > I'd gathered more samples in the first graph, this would

> have been
> > > > > > > much clearer. (memo to self...)
> > > > > > > > > > > >
> > > > > > > > > > > > I'll adjust VMAG to get the overall AGC gain range
> correct
> > > > > > > (15-65dB) and check that my system now functions per your
> paper.
> > > > > > > > > > > >
> > > > > > > > > > > > Many thanks for your help with this.
> > > > > > > > > > > >
> > > > > > > > > > > > davidh
> > > > > > > > > > > >
> > > > > > > > > > > >
> > > > > > > > > > > >
> > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>
> > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam"
> <swetterlin@>
> > > > > wrote:
> > > > > > > > > > > >
> > > > > > > > > > > > David,
> > > > > > > > > > > > Your numbers seem correct. What confuses me is how
> > > you can
> > > > > > > get such a good response with inputs up to 10 dBm.
> > > > > > > > > > > >
> > > > > > > > > > > > Per p. 16 of the data sheet, with VMag=1.2 and a
> > > load of
> > > > > > 200
> > > > > > > > ohms, the max voltage swing at the AD8330 output is +/-1.4V.
> > > At the
> > > > > > > transformer secondary, this would be halved to +/-0.7V.
> That is 7
> > > > > > dBm.
> > > > > > > > With a gain of 6.8 dB, the AD8330 should start saturating
> with an
> > > > > > > input of 0.2 dBm. There would still be increased output with
> > > > > > increased
> > > > > > > > input (the output starts to square, but the fundamental
> > > content will
> > > > > > > still increase), but the response should start to flatten at
> > > 0.2 dBm
> > > > > > > input. Your response seems very linear well beyond that.
> > > > > > > > > > > >
> > > > > > > > > > > > It seems odd to be worried about the circuit
> > > functioning
> > > > > > too
> > > > > > > well at high input levels, but I wonder whether that is
> connected

> > > > > with
> > > > > > > the low end not extending as far as it should.
> > > > > > > > > > > >
> > > > > > > > > > > > Sam W.
> > > > > > > > > > > >
> > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>
> > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > <dhooke@> wrote:
> > > > > > > > > > > >
> > > > > > > > > > > > Sam,
> > > > > > > > > > > >
> > > > > > > > > > > > Wilco on the 2k7, and yes, I have 10k/27k
> giving an
> > > > > > > overall P of 0.68.
> > > > > > > > > > > >
> > > > > > > > > > > > May I again check the VGA levels with you?
> > > > > > > > > > > >
> > > > > > > > > > > > Looking only at voltage levels, with VDBS > 1.5V:
> > > > > > > > > > > >
> > > > > > > > > > > > > input xfmr: Av=4
> > > > > > > > > > > > > loss due to 3k9: Av=0.8
> > > > > > > > > > > > > VGA: Av=1
> > > > > > > > > > > > > Vmag: Av=2.4
> > > > > > > > > > > > > output resistors: Av=0.57
> > > > > > > > > > > > > output transformer: Av=0.5
> > > > > > > > > > > >
> > > > > > > > > > > > This gives me an overall gain (50R to 50R) of
> 2.188 or
> > > > > > 6.8dB, which is exactly what I've measured.
> > > > > > > > > > > >
> > > > > > > > > > > > What am I missing?
> > > > > > > > > > > >
> > > > > > > > > > > > Thanks,
> > > > > > > > > > > >
> > > > > > > > > > > > davidh
> > > > > > > > > > >
> > > > > > > > > >
> > > > > > > > >
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7949. Call for Help

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-11 16:10:49 UTC
From: william
Topic: 7949 Message: 7949

Hi All,
I have determined that the MUN2211 buffer transistor, used in the AtoD Converter Module, needs to be replaced with a different device. Although it works as intended, it's speed is a bottle neck for the new USB control.
The best possible replacement is an open drain FET that has a gate turn-on characteristic of standard CMOS logic.
There are literally hundreds of these devices on the market and I don't have the time or testing capability to do the proper research. So, I am asking for a little help. Those of you who have a good "junk-box", find one and test it in your AtoD module. Here are the requirements:
* Size: SOT-23, SOT-23-3, TO-236, case 318-80. This is the pad size on the pwb of the AtoD.
* N-channel
* Enhancement mode
* Gate threshold: 1.0v to 3.0v, 2.5 volt preferred.
* Open Drain
* Pin-outs: Drain, top single pin; Gate, lower left pin; Source, lower right pin
* Maximum continuous current: at least 5 ma.
* Maximum drain voltage: at least 10 volts
* Turn-on and turn-off delay: 500 nsec or faster.
* Internal diode protection
* Available at Digikey in single quantities (cheap)

Here are a couple of devices that meet the reqmts. You can use their data sheets as examples in your search.
http://www.onsemi.com/pub_link/Collateral/2N7002E-D.PDF
http://www.diodes.com/datasheets/ZVN3310F.pdf

If you think you have a good device but cannot test it yourself, post to the group and arrange to send it to someone who can test it.

Scotty

7950. Re: [spectrumanalyzer] Call for Help

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-11 17:24:05 UTC
From: Greg Broburg
Topic: 7949 Message: 7950

My vote would be a 2N7002.

Greg

On 4/11/2011 10:10 AM, william wrote:
>
> Hi All,
> I have determined that the MUN2211 buffer transistor, used in the AtoD
> Converter Module, needs to be replaced with a different device.
> Although it works as intended, it's speed is a bottle neck for the new
> USB control.
> The best possible replacement is an open drain FET that has a gate
> turn-on characteristic of standard CMOS logic.
> There are literally hundreds of these devices on the market and I
> don't have the time or testing capability to do the proper research.
> So, I am asking for a little help. Those of you who have a good
> "junk-box", find one and test it in your AtoD module. Here are the
> requirements:
> * Size: SOT-23, SOT-23-3, TO-236, case 318-80. This is the pad size on
> the pwb of the AtoD.
> * N-channel
> * Enhancement mode
> * Gate threshold: 1.0v to 3.0v, 2.5 volt preferred.
> * Open Drain
> * Pin-outs: Drain, top single pin; Gate, lower left pin; Source, lower
> right pin
> * Maximum continuous current: at least 5 ma.
> * Maximum drain voltage: at least 10 volts
> * Turn-on and turn-off delay: 500 nsec or faster.
> * Internal diode protection
> * Available at Digikey in single quantities (cheap)
>
> Here are a couple of devices that meet the reqmts. You can use their
> data sheets as examples in your search.
> http://www.onsemi.com/pub_link/Collateral/2N7002E-D.PDF
> http://www.diodes.com/datasheets/ZVN3310F.pdf
>
> If you think you have a good device but cannot test it yourself, post
> to the group and arrange to send it to someone who can test it.
>
> Scotty
>
>

7951. Variations to the MSA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-11 20:06:34 UTC
From: Jim Hontoria
Topic: 7951 Message: 7951
Attachments: 1 described; binary payloads are missing from this source WARC

Hi all,

I was having a problem with too many coax intertwining in my box so I decided to do some pruning.

First I separated the newly added PLO2 post-amplifier from the TG buffer. I created two separate PCBs , encapsulated them in a round copper bushing, and plugged them directly into the PLO2 and MXr 3 SMAs (2 pigtails pruned)

Second (this is huge!), using a layout by SamW which combines the RBW switch and four filters into a single board I was able to eliminate 8 pigtails (with connectors). Also a regained acres of real estate.

See the attached file for the bloody results.

Now I have two RBW 3.8x2.5" combo boards ($20 each) and two pairs of amplifiers ($10 per pair) that I'll be happy to part from. If interested just drop me a note. Sorry, no shipping overseas.

Jim, W1JGH

7952. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-11 22:38:59 UTC
From: Sam
Topic: 7837 Message: 7952

Here is the state of the experiment so far. I replaced the 2 kHz RBW filter with the 600 Hz amplifiliter. Low end remained about -114 dBm. This indicated the bottleneck is the noise filter. Started to replace the 500 kHz noise filter with the 2 kHz filter, then remembered the amplifilter is centered at 10.693 MHz and the 2 kHz filter is at 10.7 MHz, so the pass bands don't overlap. Found a ceramic filter that was about 150 kHz BW and used it as the noise filter. Low end dropped to -119 dBm. Still gets good response at +7 dBm at MSA input. That's a range of 126 dB.

Low end was measured as the level at which the slope of ADC value per dB dropped to 10.

The drop in the low end was proportional to the reduction in noise filter bandwidth (10*log(500kHz/150kHz)=5.2 dB). This suggests that there is more to be gained by an even narrower noise filter. I will see what I can rig up.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> You might remember initially I used the 60kHz ceramic filter as a noise
> filter then after some deliberation I changed it back to 600 kHz.
> According to my record this extended the low range by an additional 5dB.
> I am looking forward to the results of putting a 2kHz filter into its place.
> Jurgen
>
> On 4/10/2011 10:29 AM, Sam wrote:
> >
> > You can't pin down the full range until you have the full chain of IF2
> > Amp--RBW filter--VGA--Noise Filter--Log Detector. The narrowness of
> > the RBW filter and noise filter affects the low end range up to a
> > point. Narrowing a filter improves the range only if that filter is
> > the bottleneck in the noise reduction plan. To see how far you can
> > extend the range, it is probably best to start with very narrow
> > filters. If it turns out, for example, that very narrow filters have a
> > range of only 5 dB more than you get with wider filters, you might
> > decide the using the switchable noise filter is not worth the trouble.
> >
> > When I did my testing, I did not have an extremely narrow RBW filter,
> > nor did I try a noise filter narrower than 60 kHz. Now that I have the
> > 600 Hz amplifilter, I plan to use it to replace my 2 kHz RBW filter,
> > which I can then try as the noise filter. (The noise filter does not
> > have anywhere near as much attenuation as the RBW filters, but an
> > extra RBW filter is convenient to use for an experiment.)
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@> wrote:

> > >
> > > Sam,
> > >
> > > Are you talking about the filter bandwidth within the VGA chain?
> > > Remember my tests include the VGA chain only.
> > > I am just getting into it again. Work gets into the way.
> > > I finally have my new scope going, probing etc.
> > > I also have the PCB's I promised, the size turned out ~ 1mm larger than
> > > the others. Don't why looks like I did not pay attention.
> > > I will ship them soon.
> > >
> > > Jurgen
> > >
> > >
> > >
> > > On 4/9/2011 9:35 AM, Sam wrote:
> > > >
> > > > Jurgen,
> > > > The main potential for greater range is the use of very narrow RBW
> > > > filters and/or a narrow noise filter. I would expect that the
> > > > combination of an RBW filter below 1 kHz with a noise filter of 7.5
> > > > kHz would improve the low end. That would of course require using a
> > > > switchable noise filter, though as an experiment you could manually
> > > > swap the noise filters. I have not tried these narrow filters.
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@> wrote:
> > > > >
> > > > > Hello David,
> > > > >
> > > > > Thanks for your reply. I logged about 14 different test
> > combination in
> > > > > an Excel spread sheet and it looks like that one is stuck with a
> > > > certain
> > > > > max linear range of about 110 dB in this circuit. No matter what I
> > > > tried
> > > > > could not get past it.
> > > > > I thought the there was a possibility to expand the top end but ran
> > > > into
> > > > > limitations.
> > > > > I finally settled for this result. I am using a 500 kHz ceramic
> > filter
> > > > > within the chain.
> > > > >
> > > > > Jurgen
> > > > >
> > > > >
> > > > >

> > > > > On 4/9/2011 3:13 AM, davidhooau wrote:
> > > > > >
> > > > > > Hi Jurgen,
> > > > > >
> > > > > > I saw very similar results to those shown in Sam's paper. I'm
> > > > going to
> > > > > > play a few more testing games, and then I'll get some results
> > graphed
> > > > > > to more definitively answer your (and my own) question.
> > > > > >
> > > > > > As expected, the was a big improvement using an RBW filter at the
> > > > > > input, compared with my earlier tests without. I only have the
> > 600Hz
> > > > > > amplifilter working at the moment but expect to add additional
> > > > filters
> > > > > > in the next few week.
> > > > > >
> > > > > > HTH.
> > > > > >
> > > > > > davidh
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@>
> > wrote:
> > > > > > >
> > > > > > > David one more question,
> > > > > > > What is your linearity within this range?
> > > > > > >
> > > > > > > Jurgen
> > > > > > >
> > > > > > > On 4/8/2011 8:19 AM, Sam wrote:
> > > > > > > >
> > > > > > > > It would be interesting to see what effect that has, but I
> > > > doubt it
> > > > > > > > will affect your range significantly, and it may actually
> > > > reduce the
> > > > > > > > range. Efficiency of power transfer is not a big issue at
> > the VGA
> > > > > > > > output (recall that I actually put an attenuator on the noise
> > > > > > filter),
> > > > > > > > so perfect impedance matching is not necessary.
> > > > > > > > Sam W.
> > > > > > >
> > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"

> > > > <dhooke@>
> > > > > > > > wrote:
> > > > > > > > >
> > > > > > > > > > Hi Sam and other VGA users,
> > > > > > > > > >
> > > > > > > > > > I've retested with RBW filters in place, and I'm happy the
> > > > expanded
> > > > > > > > > log system is working correctly (and that I understand it).
> > > > With the
> > > > > > > > > 600Hz filter, I'm getting close to 118dB range before the LD
> > > > > > starts to
> > > > > > > > plateau.
> > > > > > > > >
> > > > > > > > > Before I nail it all shut, should I replace the VGA output
> > > > > > > transformer with a 3:1 Z ratio unit to improve the output
> > > > matching?
> > > > > > > > >
> > > > > > > > > Thanks,
> > > > > > > > >
> > > > > > > > > davidh
> > > > > > > > >
> > > > > > > > >
> > > > > > > > >
> > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > <dhooke@> wrote:
> > > > > > > > > >
> > > > > > > > > > Hi Sam,
> > > > > > > > > >
> > > > > > > > > > Yes, I'm using the 500kHz noise filter we were tuning
> > a few
> > > > > > days ago.
> > > > > > > > > >
> > > > > > > > > > I've posted a slightly clearer graph, including the LD
> > alone,
> > > > > > with
> > > > > > > > some additional samples to clarify things. Now, at the
> > upper limit
> > > > > > > between 0dBm and 5dBm, you can see the slope increase as
> > we run
> > > > > > out of
> > > > > > > > AGC range, and then the LD run out of range, making the 10dBm
> > > > sample
> > > > > > > look better than it really is.
> > > > > > > > >
> > > > > > > > > For reference, the minimum AGC gain is now 7dB, the NF is
> > > > 500kHz

> > > > > > > > wide with an insertion loss of 4dB. The net division ratio
> > > > from LD to
> > > > > > > > VDBS is 0.68 and the ADC is connected per your current drawing
> > > > > > > > (between the 2k7 and 10k-27k on the AGC unit).
> > > > > > > > > >
> > > > > > > > > > I'm going to have to put testing off for a couple of
> > > > weeks, as I
> > > > > > > > have a road trip for work.
> > > > > > > > > >
> > > > > > > > > > Cheers,
> > > > > > > > >
> > > > > > > > > > davidh
> > > > > > > > > >
> > > > > > > > >
> > > > > > > > >
> > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam"
> > <swetterlin@>
> > > > > > wrote:
> > > > > > > > > >
> > > > > > > > > > David,
> > > > > > > > > > The only purpose of looking at the high end is to see
> > > > whether
> > > > > > > > there is some problem with the module that might also affect
> > > > the low
> > > > > > > > end, and we don't seem to have found any such problem. So
> > > > maybe the
> > > > > > > > abrupt flattening at the low end is due to the lack of
> > > > shielding, as
> > > > > > > > you originally suggested.
> > > > > > > > > >
> > > > > > > > > > If you try adjusting VMag, you'll find that your
> > efforts are
> > > > > > > largely defeated by the feedback loop. For example,
> > lowering VMag
> > > > > > > lowers the VGA gain, reducing the log amp input and
> > therefore the
> > > > > > > feedback voltage. The lower feedback voltage increases the
> > VGA
> > > > gain,
> > > > > > > partially cancelling the effect of the original lowering of
> > > > VMag. You
> > > > > > > get a similar effect if you adjust the feedback ratio.
> > > > > > > > > >
> > > > > > > > > > I suggest that you put the fencing and lid on the log
> > > > detector,
> > > > > > > which is where shielding is the most important, and then

> > check
> > > > the
> > > > > > low
> > > > > > > > end response.
> > > > > > > > > > >
> > > > > > > > > > > > I've been assuming you have the noise filter in place.
> > > > Is it
> > > > > > the
> > > > > > > > 500 kHz filter? Perhaps the only difference between your
> > > > response and
> > > > > > > > that in my paper is the noise filter width. I used 150
> > kHz. In
> > > > my MSA
> > > > > > > > I am using 500 kHz. I did not directly test the response
> > of the
> > > > > > > > Expanded Log Detector with that wider filter, but it did not
> > > > seem to
> > > > > > > > affect the lowest detectable signal level at the MSA input.
> > > > Possibly
> > > > > > > > the Expanded Log Detector's low end response would be
> > extended
> > > > with a
> > > > > > > > narrower filter, but that extra range is not reachable with my
> > > > > > > > narrowest RBW filter, which is now 2 kHz. Maybe a narrower
> > noise
> > > > > > > > filter would be useful when I install my 600 kHz amplifilter.
> > > > If so,
> > > > > > > > I'll have to reconsider using the switchable noise filter,
> > which
> > > > > > would
> > > > > > > > allow a wide noise filter for all RBW's except the
> > narrowest one,
> > > > > > > > where a much narrower one would kick in.
> > > > > > > > > > >
> > > > > > > > > > > As a rough calculation, if you input to the MSA a
> > signal of
> > > > > > -115
> > > > > > > > dBm and have losses of 20 dB by the time you reach the IF2
> > > > amp, the
> > > > > > > > signal is -135 dBm at that point, -107 dBm at the output of
> > > > the 28 dB
> > > > > > > > amp, and perhaps -110 dBm at the output of the RBW filter.
> > At that
> > > > > > > > point the signal will be accompanied by noise from the amp
> > > > (say, -174
> > > > > > > > dBm/Hz plus 4 created by the amp plus 28 due to
> > amplification)
> > > > equal
> > > > > > > > to -142 dBm/Hz. With a 2 kHz RBW filter with 3 dB loss,
> > that is

> > > > > > > > -142+36-3=-109 dBm of noise, accompanying the -110 dBm
> > signal. The
> > > > > > > > signal would still be discernible, but there would any point
> > > > in the
> > > > > > > > Expanded Log Detector maintaining a strong response below the
> > > > -109
> > > > > > dBm
> > > > > > > > noise level, which is about where yours (and maybe mine)
> > peters
> > > > > > out. A
> > > > > > > > narrower noise filter would therefore not be of much benefit.
> > > > With a
> > > > > > > > 600 Hz RBW filter, the noise level would be reduced by 5
> > dB, so a
> > > > > > > > narrower noise filter might increase the low end range by 5
> > > > dB. Maybe
> > > > > > > > not worth the effort.
> > > > > > > > > > >
> > > > > > > > > > > (Note that a detector that dies below -110 dBm can
> > still
> > > > detect
> > > > > > > > a -112 dBm signal if the signal is accompanied by enough
> > noise to
> > > > > > push
> > > > > > > > the total signal+noise over -110 dBm. The noise actually
> > provides
> > > > > > some
> > > > > > > > benefit! The detector needs a range that extends down to
> > the noise
> > > > > > > > level, but the actual detectable signal will extend below the
> > > > > > > > detector's nominal range.)
> > > > > > > > > > >
> > > > > > > > > > > Sam W.
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > <dhooke@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > Hi Sam,
> > > > > > > > > > >
> > > > > > > > > > > To use an American expression, I've thrown you a
> > curve
> > > > ball.
> > > > > > > > > > >
> > > > > > > > > > > When I plot more samples and look closely at the raw
> > > > data,
> > > > > > I'm

> > > > > > > > only in the "linear" range up until 0dBm input, which is
> > > > pretty close
> > > > > > > > to VDBS being 1.5V.
> > > > > > > > > > > >
> > > > > > > > > > > > At +5dBm I'm reading about 2dB high at the LD output,
> > > > as the
> > > > > > > > slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB
> > > > with my
> > > > > > > > AGC/LD combination.
> > > > > > > > > > > >
> > > > > > > > > > > > At 10dBm input limiting is taking place, I'm guessing
> > > > as the
> > > > > > > > AD8330 runs out of puff, and it just happens that this 10dBm
> > > > > > sample is
> > > > > > > > approximately in the same line as the data between -40 and
> > > > 0dBm. If
> > > > > > > > I'd gathered more samples in the first graph, this would
> > have been
> > > > > > > > much clearer. (memo to self...)
> > > > > > > > > > > >
> > > > > > > > > > > > I'll adjust VMAG to get the overall AGC gain range
> > correct
> > > > > > > > (15-65dB) and check that my system now functions per your
> > paper.
> > > > > > > > > > > >
> > > > > > > > > > > > Many thanks for your help with this.
> > > > > > > > > > > >
> > > > > > > > > > > > davidh
> > > > > > > > > > > >
> > > > > > > > > > > >
> > > > > > > > > > > >
> > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam"
> > <swetterlin@>
> > > > > > wrote:
> > > > > > > > > > > >
> > > > > > > > > > > > David,
> > > > > > > > > > > > Your numbers seem correct. What confuses me is how
> > > > you can
> > > > > > > > get such a good response with inputs up to 10 dBm.
> > > > > > > > > > > >
> > > > > > > > > > > > Per p. 16 of the data sheet, with VMag=1.2 and a
> > > > load of
> > > > > > 200
> > > > > > > > ohms, the max voltage swing at the AD8330 output is +/-1.4V.
> > > > At the
> > > > > > > > transformer secondary, this would be halved to +/-0.7V.

> > That is 7
> > > > > > dBm.
> > > > > > > > With a gain of 6.8 dB, the AD8330 should start saturating
> > with an
> > > > > > > > input of 0.2 dBm. There would still be increased output with
> > > > > > increased
> > > > > > > > input (the output starts to square, but the fundamental
> > > > content will
> > > > > > > > still increase), but the response should start to flatten at
> > > > 0.2 dBm
> > > > > > > > input. Your response seems very linear well beyond that.
> > > > > > > > > > > >
> > > > > > > > > > > > It seems odd to be worried about the circuit
> > > > functioning
> > > > > > too
> > > > > > > > well at high input levels, but I wonder whether that is
> > connected
> > > > > > with
> > > > > > > > the low end not extending as far as it should.
> > > > > > > > > > > > >
> > > > > > > > > > > > Sam W.
> > > > > > > > > > > >
> > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > <dhooke@> wrote:
> > > > > > > > > > > > >
> > > > > > > > > > > > > Sam,
> > > > > > > > > > > >
> > > > > > > > > > > > > Wilco on the 2k7, and yes, I have 10k/27k
> > giving an
> > > > > > > overall P of 0.68.
> > > > > > > > > > > > >
> > > > > > > > > > > > > May I again check the VGA levels with you?
> > > > > > > > > > > >
> > > > > > > > > > > > > Looking only at voltage levels, with VDBS > 1.5V:
> > > > > > > > > > > >
> > > > > > > > > > > > > input xfmr: Av=4
> > > > > > > > > > > > > loss due to 3k9: Av=0.8
> > > > > > > > > > > > > VGA: Av=1
> > > > > > > > > > > > > Vmag: Av=2.4
> > > > > > > > > > > > > output resistors: Av=0.57
> > > > > > > > > > > > > output transformer: Av=0.5
> > > > > > > > > > > >
> > > > > > > > > > > > > This gives me an overall gain (50R to 50R) of
> > 2.188 or
> > > > > > > 6.8dB, which is exactly what I've measured.
> > > > > > > > > > > >

```
> > > > > > > > > > > > > > > What am I missing?
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > Thanks,
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > davidh
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > >
> > > > > > > > > > > > >
> > > > > > > > > > > >
> > > > > > > > > > >
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> > > > > > > > >
> > > > > > > >
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> > > >
> > >
> >
```

7953. Re: Variations to the MSA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-12 13:03:23 UTC
From: Sam
Topic: 7951 Message: 7953

Jim, is the entire RBW board now fully functional?

To All: To this point, the RBW filters have been "to each his own". But ceramic filters seem to take care of the two broadest filters quite well, and the amplifilter is a simple way to handle the narrowest filter. That leaves only the second-narrowest filter, probably something in the 2-7.5 kHz range. If you use Jim's board, you'll have a nice, compact collection of filters that is simple to build, with the possible exception of the 2-7.5 kHz filter, which is a custom 5-filter design that will require some tuning. However, the board is also designed so that you can use an MCF design (per Lin's posted files) instead of the crystals, which would allow a 7.5 kHz design with ECS filters. Or, you could add SMA connectors to bypass the on-board layout and attach a canned filter, such as the 7.5 kHz ITT filter that several people have built.

As Jim stated, the biggest advantage of the unified RBW board is all the connectors it eliminates (8 male and 8 female), as well as the cables. That not only eliminates a lot of hassle, but saves a lot of space.

If you already have your filters put together, you may not want to use this board (I'm sticking with what I have). But if you have not yet built the filters, this board is definitely the way to go.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> Hi all,
>
> I was having a problem with too many coax intertwining in my box so I
> decided to do some pruning.
>
> First I separated the newly added PLO2 post-amplifier from the TG buffer. I
> created two separate PCBs , encapsulated them in a round copper bushing, and
> plugged them directly into the PLO2 and MXr 3 SMAs (2 pigtails pruned)
>
> Second (this is huge!), using a layout by SamW which combines the RBW switch
> and four filters into a single board I was able to eliminate 8 pigtails
> (with connectors). Also a regained acres of real estate.
>
> See the attached file for the bloody results.
>
> Now I have two RBW 3.8x2.5" combo boards ($20 each) and two pairs of
> amplifiers ($10 per pair) that I'll be happy to part from. If interested
> just drop me a note. Sorry, no shipping overseas.
>
>
> Jim, W1JGH

>

7954. Re: [spectrumanalyzer] Re: Variations to the MSA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-12 14:04:41 UTC
From: Jim Hontoria
Topic: 7951 Message: 7954

At this moment the switch, amplifilter and ceramics are completed. The 5 crystal section (5 kHz) is missing the tuning inductors from Mouser. No fences yet.
I will test it before fencing though.

There is a lot of flexibility built into the 5 crystal area , maybe too much, but nothing that a jumper will not solve.
I found some tight spots but again nothing horrible.

I have been busy working with the YIG project, most of the problems related with measuring (guesstimating rather) power at 8 Ghz. Very happy with the Hittite divide by 8 prescaler, I am planning to use one for my frequency meter so I should be reading up to 12 GHz. They sell them in multiples of ten so if there is enough interest we could make a group buy.

Jim, W1JGH

On Tue, Apr 12, 2011 at 9:03 AM, Sam <swetterlin@...> wrote:

>
>
> Jim, is the entire RBW board now fully functional?
>
> To All: To this point, the RBW filters have been "to each his own". But
> ceramic filters seem to take care of the two broadest filters quite well,
> and the amplifilter is a simple way to handle the narrowest filter. That
> leaves only the second-narrowest filter, probably something in the 2-7.5 kHz
> range. If you use Jim's board, you'll have a nice, compact collection of
> filters that is simple to build, with the possible exception of the 2-7.5
> kHz filter, which is a custom 5-filter design that will require some tuning.
> However, the board is also designed so that you can use an MCF design (per
> Lin's posted files) instead of the crystals, which would allow a 7.5 kHz
> design with ECS filters. Or, you could add SMA connectors to bypass the
> on-board layout and attach a canned filter, such as the 7.5 kHz ITT filter
> that several people have built.
>
> As Jim stated, the biggest advantage of the unified RBW board is all the
> connectors it eliminates (8 male and 8 female), as well as the cables. That
> not only eliminates a lot of hassle, but saves a lot of space.
>
> If you already have your filters put together, you may not want to use this
> board (I'm sticking with what I have). But if you have not yet built the
> filters, this board is definitely the way to go.
>
> Sam W.
>

>
> --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...>
> wrote:
> >
> > Hi all,
> >
> > I was having a problem with too many coax intertwining in my box so I
> > decided to do some pruning.
> >
> > First I separated the newly added PLO2 post-amplifier from the TG buffer.
> I
> > created two separate PCBs , encapsulated them in a round copper bushing,
> and
> > plugged them directly into the PLO2 and MXr 3 SMAs (2 pigtails pruned)
> >
> > Second (this is huge!), using a layout by SamW which combines the RBW
> switch
> > and four filters into a single board I was able to eliminate 8 pigtails
> > (with connectors). Also a regained acres of real estate.
> >
> > See the attached file for the bloody results.
> >
> > Now I have two RBW 3.8x2.5" combo boards ($20 each) and two pairs of
> > amplifiers ($10 per pair) that I'll be happy to part from. If interested
> > just drop me a note. Sorry, no shipping overseas.
> >
> >
> > Jim, W1JGH
> >
>
>
>

--
Jim G. Hontoria

7955. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-12 15:37:34 UTC
From: Sam
Topic: 7837 Message: 7955

And now for the final conclusion. I replaced the 150 kHz noise filter with 75 kHz, for a 3 dB bandwidth reduction. There was possibly a tiny improvement, with the low end maybe dropping by 1 dB to -120 dBm. But I think this indicates that there is nothing to be gained by making the noise filter bandwidth anything lower than 75 kHz, unless the RBW filter could also be narrowed.

-120 dBm is nice round number, so I'm going with that as the low end. The highest level I tested is +7 dBm, so I have range of at least 127 dB. The response at +7 is still good, so it probably can do a bit more. At the high end there will be a lot of distortion, and I'm sure phase inaccuracy, but above 0 dBm it should still be good for power measurement of isolated signals.

The 75 kHz noise filter bandwidth will not work with wide RBW filters. Even a 60 kHz RBW might not work because the ceramic noise filter might not be precisely centered at 10.7 MHz. But the 75 kHz noise filter is probably only effective with a very narrow RBW anyway. To utilize the narrow noise filter, it is necessary to use the switchable noise filter so a wider noise filter will kick in for the wider filters. My switchable noise filter has an op amp and a switch, because I was trying to avoid loss. It turns out that loss in the noise filter is of little concern, since it just has the effect of cranking up the VGA gain. I actually have mine set with fairly low op amp gain, so there is a fair amount of loss.

I designed a newer switchable noise filter that uses a switch but omits the op amp. It could probably be further simplified because the narrow noise filter can be used with the two narrowest filters, and the wide filter with the others (my wide filter will become 1 MHz). If the filters are addressed 0-3 starting from the widest (that's how it is done on the unified RBW board), that means the switching can be done with an SPDT driven by the "2" bit of the address, and the "1" bit can be ignored.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Here is the state of the experiment so far. I replaced the 2 kHz RBW filter with the 600 Hz amplifiliter. Low end remained about -114 dBm. This indicated the bottleneck is the noise filter. Started to replace the 500 kHz noise filter with the 2 kHz filter, then remembered the amplifilter is centered at 10.693 MHz and the 2 kHz filter is at 10.7 MHz, so the pass bands don't overlap. Found a ceramic filter that was about 150 kHz BW and used it as the noise filter. Low end dropped to -119 dBm. Still gets good response at +7 dBm at MSA input. That's a range of 126 dB.
>
> Low end was measured as the level at which the slope of ADC value per dB dropped to 10.
>
> The drop in the low end was proportional to the reduction in noise filter bandwidth (10*log(500kHz/150kHz)=5.2 dB). This suggests that there is more to be gained by an even narrower noise filter. I will see what I can rig up.
>

> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@> wrote:
> >
> > You might remember initially I used the 60kHz ceramic filter as a noise
> > filter then after some deliberation I changed it back to 600 kHz.
> > According to my record this extended the low range by an additional 5dB.
> > I am looking forward to the results of putting a 2kHz filter into its place.
> > Jurgen
> >
> > On 4/10/2011 10:29 AM, Sam wrote:
> > >
> > > You can't pin down the full range until you have the full chain of IF2
> > > Amp--RBW filter--VGA--Noise Filter--Log Detector. The narrowness of
> > > the RBW filter and noise filter affects the low end range up to a
> > > point. Narrowing a filter improves the range only if that filter is
> > > the bottleneck in the noise reduction plan. To see how far you can
> > > extend the range, it is probably best to start with very narrow
> > > filters. If it turns out, for example, that very narrow filters have a
> > > range of only 5 dB more than you get with wider filters, you might
> > > decide the using the switchable noise filter is not worth the trouble.
> > >
> > > When I did my testing, I did not have an extremely narrow RBW filter,
> > > nor did I try a noise filter narrower than 60 kHz. Now that I have the
> > > 600 Hz amplifilter, I plan to use it to replace my 2 kHz RBW filter,
> > > which I can then try as the noise filter. (The noise filter does not
> > > have anywhere near as much attenuation as the RBW filters, but an
> > > extra RBW filter is convenient to use for an experiment.)
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com
> > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@> wrote:
> > > >
> > > > Sam,
> > > >
> > > > Are you talking about the filter bandwidth within the VGA chain?
> > > > Remember my tests include the VGA chain only.
> > > > I am just getting into it again. Work gets into the way.
> > > > I finally have my new scope going, probing etc.
> > > > I also have the PCB's I promised, the size turned out ~ 1mm larger than
> > > > the others. Don't why looks like I did not pay attention.
> > > > I will ship them soon.
> > > >
> > > > Jurgen
> > > >
> > > >
> > > >
> > > > On 4/9/2011 9:35 AM, Sam wrote:
> > > > >
> > > > > Jurgen,

> > > > > The main potential for greater range is the use of very narrow RBW
> > > > > filters and/or a narrow noise filter. I would expect that the
> > > > > combination of an RBW filter below 1 kHz with a noise filter of 7.5
> > > > > kHz would improve the low end. That would of course require using a
> > > > > switchable noise filter, though as an experiment you could manually
> > > > > swap the noise filters. I have not tried these narrow filters.
> > > > > Sam W.
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com
> > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@> wrote:
> > > > > >
> > > > > > Hello David,
> > > > > >
> > > > > > Thanks for your reply. I logged about 14 different test
> > > combination in
> > > > > > an Excel spread sheet and it looks like that one is stuck with a
> > > > > certain
> > > > > > max linear range of about 110 dB in this circuit. No matter what I
> > > > > tried
> > > > > > could not get past it.
> > > > > > I thought the there was a possibility to expand the top end but ran
> > > > > into
> > > > > > limitations.
> > > > > > I finally settled for this result. I am using a 500 kHz ceramic
> > > filter
> > > > > > within the chain.
> > > > > >
> > > > > > Jurgen
> > > > > >
> > > > > >
> > > > > >
> > > > > > On 4/9/2011 3:13 AM, davidhooau wrote:
> > > > > > >
> > > > > > > Hi Jurgen,
> > > > > > >
> > > > > > > I saw very similar results to those shown in Sam's paper. I'm
> > > > > going to
> > > > > > > play a few more testing games, and then I'll get some results
> > > graphed
> > > > > > > to more definitively answer your (and my own) question.
> > > > > > >
> > > > > > > As expected, the was a big improvement using an RBW filter at the
> > > > > > > input, compared with my earlier tests without. I only have the
> > > 600Hz
> > > > > > > amplifilter working at the moment but expect to add additional
> > > > > filters
> > > > > > > in the next few week.
> > > > > > >
> > > > > > > HTH.

> > > > > > >
> > > > > > > davidh
> > > > > > >
> > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@>
> > > wrote:
> > > > > > > >
> > > > > > > > > David one more question,
> > > > > > > > > What is your linearity within this range?
> > > > > > > > >
> > > > > > > > > Jurgen
> > > > > > > > >
> > > > > > > > > On 4/8/2011 8:19 AM, Sam wrote:
> > > > > > > > >
> > > > > > > > > It would be interesting to see what effect that has, but I
> > > > > > doubt it
> > > > > > > > > will affect your range significantly, and it may actually
> > > > > > reduce the
> > > > > > > > > range. Efficiency of power transfer is not a big issue at
> > > the VGA
> > > > > > > > > output (recall that I actually put an attenuator on the noise
> > > > > > filter),
> > > > > > > > > so perfect impedance matching is not necessary.
> > > > > > > > > Sam W.
> > > > > > > > >
> > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > <dhooke@>
> > > > > > > > wrote:
> > > > > > > > >
> > > > > > > > > Hi Sam and other VGA users,
> > > > > > > > >
> > > > > > > > > I've retested with RBW filters in place, and I'm happy the
> > > > > > expanded
> > > > > > > > > log system is working correctly (and that I understand it).
> > > > > > With the
> > > > > > > > > 600Hz filter, I'm getting close to 118dB range before the LD
> > > > > > starts to
> > > > > > > > > plateau.
> > > > > > > > >
> > > > > > > > > Before I nail it all shut, should I replace the VGA output
> > > > > > > > > transformer with a 3:1 Z ratio unit to improve the output
> > > > > > matching?
> > > > > > > > >
> > > > > > > > > Thanks,

> > > > > > > > > >
> > > > > > > > > > > davidh
> > > > > > > > > > >
> > > > > > > > > > >
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > > <dhooke@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > Hi Sam,
> > > > > > > > > > >
> > > > > > > > > > > Yes, I'm using the 500kHz noise filter we were tuning
> > > a few
> > > > > > days ago.
> > > > > > > > > > >
> > > > > > > > > > > I've posted a slightly clearer graph, including the LD
> > > alone,
> > > > > > with
> > > > > > > > > > some additional samples to clarify things. Now, at the
> > > upper limit
> > > > > > > > > between 0dBm and 5dBm, you can see the slope increase as
> > > we run
> > > > > > out of
> > > > > > > > > AGC range, and then the LD run out of range, making the 10dBm
> > > > > sample
> > > > > > > > > look better than it really is.
> > > > > > > > > >
> > > > > > > > > > For reference, the minimum AGC gain is now 7dB, the NF is
> > > > > 500kHz
> > > > > > > > > wide with an insertion loss of 4dB. The net division ratio
> > > > > from LD to
> > > > > > > > > VDBS is 0.68 and the ADC is connected per your current drawing
> > > > > > > > > (between the 2k7 and 10k-27k on the AGC unit).
> > > > > > > > > >
> > > > > > > > > > I'm going to have to put testing off for a couple of
> > > > > weeks, as I
> > > > > > > > > have a road trip for work.
> > > > > > > > > >
> > > > > > > > > > Cheers,
> > > > > > > > > >
> > > > > > > > > > davidh
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>

> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam"
> > > <swetterlin@>
> > > > > > > wrote:
> > > > > > > > > > > > >
> > > > > > > > > > > > > > David,
> > > > > > > > > > > > > > > > The only purpose of looking at the high end is to see
> > > > > > whether
> > > > > > > > > > there is some problem with the module that might also affect
> > > > > > the low
> > > > > > > > > > > end, and we don't seem to have found any such problem. So
> > > > > > maybe the
> > > > > > > > > > > abrupt flattening at the low end is due to the lack of
> > > > > > shielding, as
> > > > > > > > > > > you originally suggested.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > If you try adjusting VMag, you'll find that your
> > > efforts are
> > > > > > > > > > largely defeated by the feedback loop. For example,
> > > lowering VMag
> > > > > > > > > > lowers the VGA gain, reducing the log amp input and
> > > therefore the
> > > > > > > > > > feedback voltage. The lower feedback voltage increases the
> > > VGA
> > > > > > gain,
> > > > > > > > > > partially cancelling the effect of the original lowering of
> > > > > > VMag. You
> > > > > > > > > > get a similar effect if you adjust the feedback ratio.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > I suggest that you put the fencing and lid on the log
> > > > > > detector,
> > > > > > > > > > which is where shielding is the most important, and then
> > > check
> > > > > > the
> > > > > > > > > > low
> > > > > > > > > > end response.
> > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > I've been assuming you have the noise filter in place.
> > > > > > Is it
> > > > > > > > > the
> > > > > > > > > > > > > 500 kHz filter? Perhaps the only difference between your
> > > > > > response and
> > > > > > > > > > that in my paper is the noise filter width. I used 150
> > > kHz. In
> > > > > > my MSA
> > > > > > > > > > > > I am using 500 kHz. I did not directly test the response
> > > of the
> > > > > > > > > > Expanded Log Detector with that wider filter, but it did not
> > > > > > seem to
> > > > > > > > > > > > affect the lowest detectable signal level at the MSA input.

> > > > > Possibly
> > > > > > > > > > the Expanded Log Detector's low end response would be
> > > extended
> > > > > with a
> > > > > > > > > > narrower filter, but that extra range is not reachable with my
> > > > > > > > > > narrowest RBW filter, which is now 2 kHz. Maybe a narrower
> > > noise
> > > > > > > > > > filter would be useful when I install my 600 kHz amplifilter.
> > > > > If so,
> > > > > > > > > > I'll have to reconsider using the switchable noise filter,
> > > which
> > > > > > > would
> > > > > > > > > > allow a wide noise filter for all RBW's except the
> > > narrowest one,
> > > > > > > > > where a much narrower one would kick in.
> > > > > > > > > > > > >
> > > > > > > > > > > > > As a rough calculation, if you input to the MSA a
> > > signal of
> > > > > > > -115
> > > > > > > > > > dBm and have losses of 20 dB by the time you reach the IF2
> > > > > > amp, the
> > > > > > > > > > signal is -135 dBm at that point, -107 dBm at the output of
> > > > > > the 28 dB
> > > > > > > > > > amp, and perhaps -110 dBm at the output of the RBW filter.
> > > At that
> > > > > > > > > > point the signal will be accompanied by noise from the amp
> > > > > > (say, -174
> > > > > > > > > > dBm/Hz plus 4 created by the amp plus 28 due to
> > > amplification)
> > > > > > equal
> > > > > > > > > > to -142 dBm/Hz. With a 2 kHz RBW filter with 3 dB loss,
> > > that is
> > > > > > > > > > -142+36-3=-109 dBm of noise, accompanying the -110 dBm
> > > signal. The
> > > > > > > > > > signal would still be discernible, but there would any point
> > > > > > in the
> > > > > > > > > > Expanded Log Detector maintaining a strong response below the
> > > > > > -109
> > > > > > > > dBm
> > > > > > > > > > noise level, which is about where yours (and maybe mine)
> > > peters
> > > > > > out. A
> > > > > > > > > > narrower noise filter would therefore not be of much benefit.
> > > > > With a
> > > > > > > > > > 600 Hz RBW filter, the noise level would be reduced by 5
> > > dB, so a
> > > > > > > > > > narrower noise filter might increase the low end range by 5
> > > > > > dB. Maybe
> > > > > > > > > > not worth the effort.
> > > > > > > > > > > > >

> > > > > > > > > > > > > (Note that a detector that dies below -110 dBm can
> > > still
> > > > > detect
> > > > > > > > > > a -112 dBm signal if the signal is accompanied by enough
> > > noise to
> > > > > > > push
> > > > > > > > > > the total signal+noise over -110 dBm. The noise actually
> > > provides
> > > > > > > some
> > > > > > > > > > benefit! The detector needs a range that extends down to
> > > the noise
> > > > > > > > > > level, but the actual detectable signal will extend below the
> > > > > > > > > > detector's nominal range.)
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > > <dhooke@> wrote:
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > Hi Sam,
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > To use an American expression, I've thrown you a
> > > curve
> > > > > > ball.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > When I plot more samples and look closely at the raw
> > > > > > data,
> > > > > > > > I'm
> > > > > > > > > > only in the "linear" range up until 0dBm input, which is
> > > > > > pretty close
> > > > > > > > > > to VDBS being 1.5V.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > At +5dBm I'm reading about 2dB high at the LD output,
> > > > > > as the
> > > > > > > > > > slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB
> > > > > > with my
> > > > > > > > > > AGC/LD combination.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > At 10dBm input limiting is taking place, I'm guessing
> > > > > > as the
> > > > > > > > > > AD8330 runs out of puff, and it just happens that this 10dBm
> > > > > > sample is
> > > > > > > > > > approximately in the same line as the data between -40 and
> > > > > > 0dBm. If
> > > > > > > > > > I'd gathered more samples in the first graph, this would
> > > have been

> > > > > > > > > much clearer. (memo to self...)
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > I'll adjust VMAG to get the overall AGC gain range
> > > correct
> > > > > > > > > (15-65dB) and check that my system now functions per your
> > > paper.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Many thanks for your help with this.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > davidh
> > > > > > > > > > > > > >
> > > > > > > > > > > > > >
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam"
> > > <swetterlin@>
> > > > > > wrote:
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > David,
> > > > > > > > > > > > > > > Your numbers seem correct. What confuses me is how
> > > > > you can
> > > > > > > > > get such a good response with inputs up to 10 dBm.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Per p. 16 of the data sheet, with VMag=1.2 and a
> > > > > load of
> > > > > > > 200
> > > > > > > > > ohms, the max voltage swing at the AD8330 output is +/-1.4V.
> > > > > At the
> > > > > > > > transformer secondary, this would be halved to +/-0.7V.
> > > That is 7
> > > > > > dBm.
> > > > > > > > > With a gain of 6.8 dB, the AD8330 should start saturating
> > > with an
> > > > > > > > input of 0.2 dBm. There would still be increased output with
> > > > > > increased
> > > > > > > > > input (the output starts to square, but the fundamental
> > > > > content will
> > > > > > > > still increase), but the response should start to flatten at
> > > > > 0.2 dBm
> > > > > > > > input. Your response seems very linear well beyond that.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > It seems odd to be worried about the circuit
> > > > > functioning
> > > > > > > too
> > > > > > > > > well at high input levels, but I wonder whether that is
> > > connected
> > > > > > > with

> > > > > > > > > the low end not extending as far as it should.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > > > <dhooke@> wrote:
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Sam,
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Wilco on the 2k7, and yes, I have 10k/27k
> > > giving an
> > > > > > > > overall P of 0.68.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > May I again check the VGA levels with you?
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Looking only at voltage levels, with VDBS > 1.5V:
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > input xfmr: Av=4
> > > > > > > > > > > > > > > loss due to 3k9: Av=0.8
> > > > > > > > > > > > > > > VGA: Av=1
> > > > > > > > > > > > > > > Vmag: Av=2.4
> > > > > > > > > > > > > > > output resistors: Av=0.57
> > > > > > > > > > > > > > > output transformer: Av=0.5
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > This gives me an overall gain (50R to 50R) of
> > > 2.188 or
> > > > > > > > 6.8dB, which is exactly what I've measured.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > What am I missing?
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Thanks,
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > davidh
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > >
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> >
>

7956. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-12 17:03:17 UTC
From: Sam
Topic: 7837 Message: 7956

One further comment. I used a 28 dB IF2 amp instead of Scotty's 40 dB amp. I'm wary of blasting too much power through the RBW filters with high level MSA inputs. But if you are willing to go with the higher power through the filters, you can use the 40 dB amp with the Expanded Log Detector, and perhaps pick up another 10 dB on the low end, though you will possibly lose some of that from the high end.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> And now for the final conclusion. I replaced the 150 kHz noise filter with 75 kHz, for a 3 dB bandwidth reduction. There was possibly a tiny improvement, with the low end maybe dropping by 1 dB to -120 dBm. But I think this indicates that there is nothing to be gained by making the noise filter bandwidth anything lower than 75 kHz, unless the RBW filter could also be narrowed.
>
> -120 dBm is nice round number, so I'm going with that as the low end. The highest level I tested is +7 dBm, so I have range of at least 127 dB. The response at +7 is still good, so it probably can do a bit more. At the high end there will be a lot of distortion, and I'm sure phase inaccuracy, but above 0 dBm it should still be good for power measurement of isolated signals.
>
> The 75 kHz noise filter bandwidth will not work with wide RBW filters. Even a 60 kHz RBW might not work because the ceramic noise filter might not be precisely centered at 10.7 MHz. But the 75 kHz noise filter is probably only effective with a very narrow RBW anyway. To utilize the narrow noise filter, it is necessary to use the switchable noise filter so a wider noise filter will kick in for the wider filters. My switchable noise filter has an op amp and a switch, because I was trying to avoid loss. It turns out that loss in the noise filter is of little concern, since it just has the effect of cranking up the VGA gain. I actually have mine set with fairly low op amp gain, so there is a fair amount of loss.
>
> I designed a newer switchable noise filter that uses a switch but omits the op amp. It could probably be further simplified because the narrow noise filter can be used with the two narrowest filters, and the wide filter with the others (my wide filter will become 1 MHz). If the filters are addressed 0-3 starting from the widest (that's how it is done on the unified RBW board), that means the switching can be done with an SPDT driven by the "2" bit of the address, and the "1" bit can be ignored.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Here is the state of the experiment so far. I replaced the 2 kHz RBW filter with the 600 Hz amplifiliter. Low end remained about -114 dBm. This indicated the bottleneck is the noise filter. Started to replace the 500 kHz noise filter with the 2 kHz filter, then remembered the amplifilter is centered at 10.693 MHz and the 2 kHz filter is at 10.7 MHz,

so the pass bands don't overlap. Found a ceramic filter that was about 150 kHz BW and used it as the noise filter. Low end dropped to -119 dBm. Still gets good response at +7 dBm at MSA input. That's a range of 126 dB.
> >
> > Low end was measured as the level at which the slope of ADC value per dB dropped to 10.
> >
> > The drop in the low end was proportional to the reduction in noise filter bandwidth (10*log(500kHz/150kHz)=5.2 dB). This suggests that there is more to be gained by an even narrower noise filter. I will see what I can rig up.
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@> wrote:
> > >
> > > You might remember initially I used the 60kHz ceramic filter as a noise
> > > filter then after some deliberation I changed it back to 600 kHz.
> > > According to my record this extended the low range by an additional 5dB.
> > > I am looking forward to the results of putting a 2kHz filter into its place.
> > > Jurgen
> > >
> > > On 4/10/2011 10:29 AM, Sam wrote:
> > > >
> > > > You can't pin down the full range until you have the full chain of IF2
> > > > Amp--RBW filter--VGA--Noise Filter--Log Detector. The narrowness of
> > > > the RBW filter and noise filter affects the low end range up to a
> > > > point. Narrowing a filter improves the range only if that filter is
> > > > the bottleneck in the noise reduction plan. To see how far you can
> > > > extend the range, it is probably best to start with very narrow
> > > > filters. If it turns out, for example, that very narrow filters have a
> > > > range of only 5 dB more than you get with wider filters, you might
> > > > decide the using the switchable noise filter is not worth the trouble.
> > > >
> > > > When I did my testing, I did not have an extremely narrow RBW filter,
> > > > nor did I try a noise filter narrower than 60 kHz. Now that I have the
> > > > 600 Hz amplifilter, I plan to use it to replace my 2 kHz RBW filter,
> > > > which I can then try as the noise filter. (The noise filter does not
> > > > have anywhere near as much attenuation as the RBW filters, but an
> > > > extra RBW filter is convenient to use for an experiment.)
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@> wrote:
> > > > >
> > > > > Sam,
> > > > >
> > > > > Are you talking about the filter bandwidth within the VGA chain?
> > > > > Remember my tests include the VGA chain only.
> > > > > I am just getting into it again. Work gets into the way.
> > > > > I finally have my new scope going, probing etc.
> > > > > I also have the PCB's I promised, the size turned out ~ 1mm larger than
> > > > > the others. Don't why looks like I did not pay attention.

> > > > > I will ship them soon.
> > > > >
> > > > > Jurgen
> > > > >
> > > > >
> > > > >
> > > > > On 4/9/2011 9:35 AM, Sam wrote:
> > > > > >
> > > > > > Jurgen,
> > > > > > The main potential for greater range is the use of very narrow RBW
> > > > > > filters and/or a narrow noise filter. I would expect that the
> > > > > > combination of an RBW filter below 1 kHz with a noise filter of 7.5
> > > > > > kHz would improve the low end. That would of course require using a
> > > > > > switchable noise filter, though as an experiment you could manually
> > > > > > swap the noise filters. I have not tried these narrow filters.
> > > > > > Sam W.
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@> wrote:
> > > > > > >
> > > > > > > Hello David,
> > > > > > >
> > > > > > > Thanks for your reply. I logged about 14 different test
> > > > combination in
> > > > > > > an Excel spread sheet and it looks like that one is stuck with a
> > > > > > certain
> > > > > > > max linear range of about 110 dB in this circuit. No matter what I
> > > > > > tried
> > > > > > > could not get past it.
> > > > > > > I thought the there was a possibility to expand the top end but ran
> > > > > > into
> > > > > > > limitations.
> > > > > > > I finally settled for this result. I am using a 500 kHz ceramic
> > > > filter
> > > > > > > within the chain.
> > > > > > >
> > > > > > > Jurgen
> > > > > > >
> > > > > > >
> > > > > > >
> > > > > > > On 4/9/2011 3:13 AM, davidhooau wrote:
> > > > > > >
> > > > > > > Hi Jurgen,
> > > > > > >
> > > > > > > I saw very similar results to those shown in Sam's paper. I'm
> > > > > > going to
> > > > > > > play a few more testing games, and then I'll get some results
> > > > graphed
> > > > > > > to more definitively answer your (and my own) question.

> > > > > > > >
> > > > > > > > As expected, the was a big improvement using an RBW filter at the
> > > > > > > > input, compared with my earlier tests without. I only have the
> > > > 600Hz
> > > > > > > > amplifilter working at the moment but expect to add additional
> > > > > > filters
> > > > > > > > in the next few week.
> > > > > > > >
> > > > > > > > HTH.
> > > > > > > >
> > > > > > > > davidh
> > > > > > > >
> > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@>
> > > > wrote:
> > > > > > > >
> > > > > > > > David one more question,
> > > > > > > > What is your linearity within this range?
> > > > > > > >
> > > > > > > > Jurgen
> > > > > > > >
> > > > > > > > On 4/8/2011 8:19 AM, Sam wrote:
> > > > > > > >
> > > > > > > > It would be interesting to see what effect that has, but I
> > > > > > doubt it
> > > > > > > > will affect your range significantly, and it may actually
> > > > > > reduce the
> > > > > > > > range. Efficiency of power transfer is not a big issue at
> > > > the VGA
> > > > > > > > output (recall that I actually put an attenuator on the noise
> > > > > > > > filter),
> > > > > > > > so perfect impedance matching is not necessary.
> > > > > > > > Sam W.
> > > > > > > >
> > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > <dhooke@>
> > > > > > > > wrote:
> > > > > > > >
> > > > > > > > Hi Sam and other VGA users,
> > > > > > > >
> > > > > > > > I've retested with RBW filters in place, and I'm happy the
> > > > > > expanded
> > > > > > > > log system is working correctly (and that I understand it).
> > > > > > With the

> > > > > > > > > > 600Hz filter, I'm getting close to 118dB range before the LD
> > > > > > > > > starts to
> > > > > > > > > > > plateau.
> > > > > > > > > > > >
> > > > > > > > > > > > Before I nail it all shut, should I replace the VGA output
> > > > > > > > > > > transformer with a 3:1 Z ratio unit to improve the output
> > > > > > > matching?
> > > > > > > > > > > >
> > > > > > > > > > > > Thanks,
> > > > > > > > > > > >
> > > > > > > > > > > > davidh
> > > > > > > > > > > >
> > > > > > > > > > > >
> > > > > > > > > > > >
> > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > > > <dhooke@> wrote:
> > > > > > > > > > > >
> > > > > > > > > > > > Hi Sam,
> > > > > > > > > > > >
> > > > > > > > > > > > Yes, I'm using the 500kHz noise filter we were tuning
> > > > > a few
> > > > > > > > days ago.
> > > > > > > > > > > >
> > > > > > > > > > > > I've posted a slightly clearer graph, including the LD
> > > > > alone,
> > > > > > > > with
> > > > > > > > > > > some additional samples to clarify things. Now, at the
> > > > > upper limit
> > > > > > > > > > between 0dBm and 5dBm, you can see the slope increase as
> > > > > we run
> > > > > > > > out of
> > > > > > > > > > > AGC range, and then the LD run out of range, making the 10dBm
> > > > > > > sample
> > > > > > > > > > > look better than it really is.
> > > > > > > > > > > >
> > > > > > > > > > > > For reference, the minimum AGC gain is now 7dB, the NF is
> > > > > > > 500kHz
> > > > > > > > > > > wide with an insertion loss of 4dB. The net division ratio
> > > > > > > from LD to
> > > > > > > > > > > VDBS is 0.68 and the ADC is connected per your current drawing
> > > > > > > > > > > (between the 2k7 and 10k-27k on the AGC unit).
> > > > > > > > > > > >
> > > > > > > > > > > > I'm going to have to put testing off for a couple of
> > > > > > > weeks, as I
> > > > > > > > > > have a road trip for work.
> > > > > > > > > > > >

> > > > > > > > > > > > > Cheers,
> > > > > > > > > > > > >
> > > > > > > > > > > > > davidh
> > > > > > > > > > > > >
> > > > > > > > > > > > >
> > > > > > > > > > > > >
> > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam"
> > > > <swetterlin@>
> > > > > > > > wrote:
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > David,
> > > > > > > > > > > > > > > > > The only purpose of looking at the high end is to see
> > > > > > whether
> > > > > > > > > > > there is some problem with the module that might also affect
> > > > > > the low
> > > > > > > > > > > end, and we don't seem to have found any such problem. So
> > > > > > maybe the
> > > > > > > > > > > abrupt flattening at the low end is due to the lack of
> > > > > > shielding, as
> > > > > > > > > > > you originally suggested.
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > If you try adjusting VMag, you'll find that your
> > > > efforts are
> > > > > > > > > > > largely defeated by the feedback loop. For example,
> > > > lowering VMag
> > > > > > > > > > > lowers the VGA gain, reducing the log amp input and
> > > > therefore the
> > > > > > > > > > > feedback voltage. The lower feedback voltage increases the
> > > > VGA
> > > > > > gain,
> > > > > > > > > > > partially cancelling the effect of the original lowering of
> > > > > > VMag. You
> > > > > > > > > > > get a similar effect if you adjust the feedback ratio.
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > I suggest that you put the fencing and lid on the log
> > > > > > detector,
> > > > > > > > > > > which is where shielding is the most important, and then
> > > > check
> > > > > > the
> > > > > > > > > > > low
> > > > > > > > > > > end response.
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > I've been assuming you have the noise filter in place.
> > > > > > Is it
> > > > > > > > > > > the
> > > > > > > > > > > 500 kHz filter? Perhaps the only difference between your

> > > > > > response and
> > > > > > > > > > > that in my paper is the noise filter width. I used 150
> > > > kHz. In
> > > > > > my MSA
> > > > > > > > > > I am using 500 kHz. I did not directly test the response
> > > > of the
> > > > > > > > > > Expanded Log Detector with that wider filter, but it did not
> > > > > > seem to
> > > > > > > > > > > affect the lowest detectable signal level at the MSA input.
> > > > > > Possibly
> > > > > > > > > > > the Expanded Log Detector's low end response would be
> > > > extended
> > > > > > with a
> > > > > > > > > > > narrower filter, but that extra range is not reachable with my
> > > > > > > > > > narrowest RBW filter, which is now 2 kHz. Maybe a narrower
> > > > noise
> > > > > > > > > > filter would be useful when I install my 600 kHz amplifilter.
> > > > > > If so,
> > > > > > > > > > > I'll have to reconsider using the switchable noise filter,
> > > > which
> > > > > > > > would
> > > > > > > > > > > allow a wide noise filter for all RBW's except the
> > > > narrowest one,
> > > > > > > > > > where a much narrower one would kick in.
> > > > > > > > > > > > >
> > > > > > > > > > > > > As a rough calculation, if you input to the MSA a
> > > > signal of
> > > > > > > > -115
> > > > > > > > > > dBm and have losses of 20 dB by the time you reach the IF2
> > > > > > amp, the
> > > > > > > > > > signal is -135 dBm at that point, -107 dBm at the output of
> > > > > > the 28 dB
> > > > > > > > > > amp, and perhaps -110 dBm at the output of the RBW filter.
> > > > At that
> > > > > > > > > > point the signal will be accompanied by noise from the amp
> > > > > > (say, -174
> > > > > > > > > > dBm/Hz plus 4 created by the amp plus 28 due to
> > > > amplification)
> > > > > > equal
> > > > > > > > > > to -142 dBm/Hz. With a 2 kHz RBW filter with 3 dB loss,
> > > > that is
> > > > > > > > > > -142+36-3=-109 dBm of noise, accompanying the -110 dBm
> > > > signal. The
> > > > > > > > > > signal would still be discernible, but there would any point
> > > > > > in the
> > > > > > > > > > Expanded Log Detector maintaining a strong response below the
> > > > > > -109
> > > > > > > > dBm
> > > > > > > > > > noise level, which is about where yours (and maybe mine)
> > > > peters

> > > > > > > > out. A
> > > > > > > > > > narrower noise filter would therefore not be of much benefit.
> > > > > > With a
> > > > > > > > > > 600 Hz RBW filter, the noise level would be reduced by 5
> > > > dB, so a
> > > > > > > > > > narrower noise filter might increase the low end range by 5
> > > > > > dB. Maybe
> > > > > > > > > > not worth the effort.
> > > > > > > > > > > > >
> > > > > > > > > > > > > > (Note that a detector that dies below -110 dBm can
> > > > still
> > > > > > detect
> > > > > > > > > > a -112 dBm signal if the signal is accompanied by enough
> > > > noise to
> > > > > > > > push
> > > > > > > > > > the total signal+noise over -110 dBm. The noise actually
> > > > provides
> > > > > > > > some
> > > > > > > > > > benefit! The detector needs a range that extends down to
> > > > the noise
> > > > > > > > > > level, but the actual detectable signal will extend below the
> > > > > > > > > > detector's nominal range.)
> > > > > > > > > > > > >
> > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > >
> > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>
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> > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > > > <dhooke@> wrote:
> > > > > > > > > > > > >
> > > > > > > > > > > > > Hi Sam,
> > > > > > > > > > > > >
> > > > > > > > > > > > > To use an American expression, I've thrown you a
> > > > curve
> > > > > > ball.
> > > > > > > > > > > > >
> > > > > > > > > > > > > When I plot more samples and look closely at the raw
> > > > > > data,
> > > > > > > > I'm
> > > > > > > > > > only in the "linear" range up until 0dBm input, which is
> > > > > > pretty close
> > > > > > > > > to VDBS being 1.5V.
> > > > > > > > > > > > >
> > > > > > > > > > > > > At +5dBm I'm reading about 2dB high at the LD output,
> > > > > > as the
> > > > > > > > > > slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB
> > > > > > with my
> > > > > > > > > > AGC/LD combination.

> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > At 10dBm input limiting is taking place, I'm guessing
> > > > > > as the
> > > > > > > > > > > AD8330 runs out of puff, and it just happens that this 10dBm
> > > > > > > > > sample is
> > > > > > > > > > > approximately in the same line as the data between -40 and
> > > > > > 0dBm. If
> > > > > > > > > > > I'd gathered more samples in the first graph, this would
> > > > have been
> > > > > > > > > > much clearer. (memo to self...)
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > I'll adjust VMAG to get the overall AGC gain range
> > > > correct
> > > > > > > > > > (15-65dB) and check that my system now functions per your
> > > > paper.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Many thanks for your help with this.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > davidh
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
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> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam"
> > > > <swetterlin@>
> > > > > > > > wrote:
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > David,
> > > > > > > > > > > > > > > Your numbers seem correct. What confuses me is how
> > > > > > you can
> > > > > > > > > > get such a good response with inputs up to 10 dBm.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Per p. 16 of the data sheet, with VMag=1.2 and a
> > > > > > load of
> > > > > > > > 200
> > > > > > > > > > ohms, the max voltage swing at the AD8330 output is +/-1.4V.
> > > > > > At the
> > > > > > > > > > transformer secondary, this would be halved to +/-0.7V.
> > > > That is 7
> > > > > > > > dBm.
> > > > > > > > > > With a gain of 6.8 dB, the AD8330 should start saturating
> > > > with an
> > > > > > > > > > input of 0.2 dBm. There would still be increased output with
> > > > > > > > increased
> > > > > > > > > > input (the output starts to square, but the fundamental
> > > > > > content will
> > > > > > > > > > still increase), but the response should start to flatten at

> > > > > > 0.2 dBm
> > > > > > > > > > input. Your response seems very linear well beyond that.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > It seems odd to be worried about the circuit
> > > > > > functioning
> > > > > > > > > too
> > > > > > > > > > > well at high input levels, but I wonder whether that is
> > > > connected
> > > > > > > > with
> > > > > > > > > > the low end not extending as far as it should.
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>
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> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > > > <dhooke@> wrote:
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Sam,
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Wilco on the 2k7, and yes, I have 10k/27k
> > > > giving an
> > > > > > > > > overall P of 0.68.
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > May I again check the VGA levels with you?
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Looking only at voltage levels, with VDBS > 1.5V:
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > input xfmr: Av=4
> > > > > > > > > > > > > > > > loss due to 3k9: Av=0.8
> > > > > > > > > > > > > > > > VGA: Av=1
> > > > > > > > > > > > > > > > Vmag: Av=2.4
> > > > > > > > > > > > > > > > output resistors: Av=0.57
> > > > > > > > > > > > > > > > output transformer: Av=0.5
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > This gives me an overall gain (50R to 50R) of
> > > > 2.188 or
> > > > > > > > > 6.8dB, which is exactly what I've measured.
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > What am I missing?
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > Thanks,
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > davidh
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > >
> > > > > > > > > > > > >

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>
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7957. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-14 17:03:13 UTC
From: Sam
Topic: 7837 Message: 7957

I now have the switched noise filter properly shielded and installed in the MSA. It ties into the RBW Switch control lines. Here is my low end with various filters:

RBW=600Hz NoiseFilt=75kHz LowEnd=-121 dBm
RBW=8kHz NoiseFilt=75kHz LowEnd=-112 dBm
RBW=60kHz NoiseFilt=1MHz LowEnd=-105 dBm
RBW=400kHz NoiseFilt=1MHz LowEnd=-97 dBm

In all cases the response tested well to +7 dBm, which is the highest level I can conveniently test.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> One further comment. I used a 28 dB IF2 amp instead of Scotty's 40 dB amp. I'm wary of blasting too much power through the RBW filters with high level MSA inputs. But if you are willing to go with the higher power through the filters, you can use the 40 dB amp with the Expanded Log Detector, and perhaps pick up another 10 dB on the low end, though you will possibly lose some of that from the high end.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > And now for the final conclusion. I replaced the 150 kHz noise filter with 75 kHz, for a 3 dB bandwidth reduction. There was possibly a tiny improvement, with the low end maybe dropping by 1 dB to -120 dBm. But I think this indicates that there is nothing to be gained by making the noise filter bandwidth anything lower than 75 kHz, unless the RBW filter could also be narrowed.
> >
> > -120 dBm is nice round number, so I'm going with that as the low end. The highest level I tested is +7 dBm, so I have range of at least 127 dB. The response at +7 is still good, so it probably can do a bit more. At the high end there will be a lot of distortion, and I'm sure phase inaccuracy, but above 0 dBm it should still be good for power measurement of isolated signals.
> >
> > The 75 kHz noise filter bandwidth will not work with wide RBW filters. Even a 60 kHz RBW might not work because the ceramic noise filter might not be precisely centered at 10.7 MHz. But the 75 kHz noise filter is probably only effective with a very narrow RBW anyway. To utilize the narrow noise filter, it is necessary to use the switchable noise filter so a wider noise filter will kick in for the wider filters. My switchable noise filter has an op amp and a switch, because I was trying to avoid loss. It turns out that loss in the noise filter is of little concern, since it just has the effect of cranking up the VGA gain. I actually have mine set with fairly low op amp gain, so there is a fair amount of loss.
> >
> > I designed a newer switchable noise filter that uses a switch but omits the op amp. It

could probably be further simplified because the narrow noise filter can be used with the two narrowest filters, and the wide filter with the others (my wide filter will become 1 MHz). If the filters are addressed 0-3 starting from the widest (that's how it is done on the unified RBW board), that means the switching can be done with an SPDT driven by the "2" bit of the address, and the "1" bit can be ignored.
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > Here is the state of the experiment so far. I replaced the 2 kHz RBW filter with the 600 Hz amplifiliter. Low end remained about -114 dBm. This indicated the bottleneck is the noise filter. Started to replace the 500 kHz noise filter with the 2 kHz filter, then remembered the amplifilter is centered at 10.693 MHz and the 2 kHz filter is at 10.7 MHz, so the pass bands don't overlap. Found a ceramic filter that was about 150 kHz BW and used it as the noise filter. Low end dropped to -119 dBm. Still gets good response at +7 dBm at MSA input. That's a range of 126 dB.
> > >
> > > Low end was measured as the level at which the slope of ADC value per dB dropped to 10.
> > >
> > > The drop in the low end was proportional to the reduction in noise filter bandwidth (10*log(500kHz/150kHz)=5.2 dB). This suggests that there is more to be gained by an even narrower noise filter. I will see what I can rig up.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@> wrote:
> > > >
> > > > You might remember initially I used the 60kHz ceramic filter as a noise
> > > > filter then after some deliberation I changed it back to 600 kHz.
> > > > According to my record this extended the low range by an additional 5dB.
> > > > I am looking forward to the results of putting a 2kHz filter into its place.
> > > > Jurgen
> > > >
> > > > On 4/10/2011 10:29 AM, Sam wrote:
> > > > >
> > > > > You can't pin down the full range until you have the full chain of IF2
> > > > > Amp--RBW filter--VGA--Noise Filter--Log Detector. The narrowness of
> > > > > the RBW filter and noise filter affects the low end range up to a
> > > > > point. Narrowing a filter improves the range only if that filter is
> > > > > the bottleneck in the noise reduction plan. To see how far you can
> > > > > extend the range, it is probably best to start with very narrow
> > > > > filters. If it turns out, for example, that very narrow filters have a
> > > > > range of only 5 dB more than you get with wider filters, you might
> > > > > decide the using the switchable noise filter is not worth the trouble.
> > > > >
> > > > > When I did my testing, I did not have an extremely narrow RBW filter,
> > > > > nor did I try a noise filter narrower than 60 kHz. Now that I have the
> > > > > 600 Hz amplifilter, I plan to use it to replace my 2 kHz RBW filter,
> > > > > which I can then try as the noise filter. (The noise filter does not

> > > > > have anywhere near as much attenuation as the RBW filters, but an
> > > > > extra RBW filter is convenient to use for an experiment.)
> > > > > Sam W.
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@> wrote:
> > > > > >
> > > > > > Sam,
> > > > > >
> > > > > > Are you talking about the filter bandwidth within the VGA chain?
> > > > > > Remember my tests include the VGA chain only.
> > > > > > I am just getting into it again. Work gets into the way.
> > > > > > I finally have my new scope going, probing etc.
> > > > > > I also have the PCB's I promised, the size turned out ~ 1mm larger than
> > > > > > the others. Don't why looks like I did not pay attention.
> > > > > > I will ship them soon.
> > > > > >
> > > > > > Jurgen
> > > > > >
> > > > > >
> > > > > >
> > > > > > On 4/9/2011 9:35 AM, Sam wrote:
> > > > > > >
> > > > > > > Jurgen,
> > > > > > > The main potential for greater range is the use of very narrow RBW
> > > > > > > filters and/or a narrow noise filter. I would expect that the
> > > > > > > combination of an RBW filter below 1 kHz with a noise filter of 7.5
> > > > > > > kHz would improve the low end. That would of course require using a
> > > > > > > switchable noise filter, though as an experiment you could manually
> > > > > > > swap the noise filters. I have not tried these narrow filters.
> > > > > > > Sam W.
> > > > > > >
> > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@> wrote:
> > > > > > > >
> > > > > > > > Hello David,
> > > > > > > >
> > > > > > > > Thanks for your reply. I logged about 14 different test
> > > > > > combination in
> > > > > > > > an Excel spread sheet and it looks like that one is stuck with a
> > > > > > > certain
> > > > > > > > max linear range of about 110 dB in this circuit. No matter what I
> > > > > > > tried
> > > > > > > > could not get past it.
> > > > > > > > I thought the there was a possibility to expand the top end but ran
> > > > > > > into
> > > > > > > > limitations.
> > > > > > > > I finally settled for this result. I am using a 500 kHz ceramic
> > > > > > filter

> > > > > > > > within the chain.
> > > > > > > >
> > > > > > > > Jurgen
> > > > > > > >
> > > > > > > >
> > > > > > > >
> > > > > > > > On 4/9/2011 3:13 AM, davidhooau wrote:
> > > > > > > > >
> > > > > > > > > Hi Jurgen,
> > > > > > > > >
> > > > > > > > > I saw very similar results to those shown in Sam's paper. I'm
> > > > > > > going to
> > > > > > > > > play a few more testing games, and then I'll get some results
> > > > > graphed
> > > > > > > > > to more definitively answer your (and my own) question.
> > > > > > > >
> > > > > > > > > As expected, the was a big improvement using an RBW filter at the
> > > > > > > > input, compared with my earlier tests without. I only have the
> > > > > 600Hz
> > > > > > > > amplifilter working at the moment but expect to add additional
> > > > > > filters
> > > > > > > > in the next few week.
> > > > > > > >
> > > > > > > > HTH.
> > > > > > > >
> > > > > > > > davidh
> > > > > > > >
> > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@>
> > > > > wrote:
> > > > > > > > >
> > > > > > > > > David one more question,
> > > > > > > > What is your linearity within this range?
> > > > > > > >
> > > > > > > > Jurgen
> > > > > > > >
> > > > > > > > On 4/8/2011 8:19 AM, Sam wrote:
> > > > > > > > >
> > > > > > > > > It would be interesting to see what effect that has, but I
> > > > > > doubt it
> > > > > > > > > will affect your range significantly, and it may actually
> > > > > > reduce the
> > > > > > > > range. Efficiency of power transfer is not a big issue at
> > > > > the VGA
> > > > > > > > output (recall that I actually put an attenuator on the noise
> > > > > > filter),
> > > > > > > > so perfect impedance matching is not necessary.
> > > > > > > > Sam W.

> > > > > > > > > > >
> > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > > > <dhooke@>
> > > > > > > > > > > > wrote:
> > > > > > > > > > > >
> > > > > > > > > > > > > Hi Sam and other VGA users,
> > > > > > > > > > > >
> > > > > > > > > > > > > I've retested with RBW filters in place, and I'm happy the
> > > > > > > > expanded
> > > > > > > > > > > > log system is working correctly (and that I understand it).
> > > > > > > With the
> > > > > > > > > > > > 600Hz filter, I'm getting close to 118dB range before the LD
> > > > > > > > > starts to
> > > > > > > > > > > > plateau.
> > > > > > > > > > > >
> > > > > > > > > > > > > Before I nail it all shut, should I replace the VGA output
> > > > > > > > > > > transformer with a 3:1 Z ratio unit to improve the output
> > > > > > > matching?
> > > > > > > > > > > >
> > > > > > > > > > > > > Thanks,
> > > > > > > > > > > >
> > > > > > > > > > > > > davidh
> > > > > > > > > > > >
> > > > > > > > > > > >
> > > > > > > > > > > >
> > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > > > <dhooke@> wrote:
> > > > > > > > > > > >
> > > > > > > > > > > > > Hi Sam,
> > > > > > > > > > > >
> > > > > > > > > > > > > Yes, I'm using the 500kHz noise filter we were tuning
> > > > > > a few
> > > > > > > > > days ago.
> > > > > > > > > > > >
> > > > > > > > > > > > > I've posted a slightly clearer graph, including the LD
> > > > > > alone,
> > > > > > > > > with
> > > > > > > > > > > > some additional samples to clarify things. Now, at the
> > > > > > upper limit
> > > > > > > > > > > > between 0dBm and 5dBm, you can see the slope increase as
> > > > > > we run
> > > > > > > > > out of

> > > > > > > > > > > > AGC range, and then the LD run out of range, making the 10dBm
> > > > > > > sample
> > > > > > > > > > > > look better than it really is.
> > > > > > > > > > > > >
> > > > > > > > > > > > > For reference, the minimum AGC gain is now 7dB, the NF is
> > > > > > > 500kHz
> > > > > > > > > > > > wide with an insertion loss of 4dB. The net division ratio
> > > > > > > from LD to
> > > > > > > > > > > VDBS is 0.68 and the ADC is connected per your current drawing
> > > > > > > > > > > (between the 2k7 and 10k-27k on the AGC unit).
> > > > > > > > > > > > >
> > > > > > > > > > > > I'm going to have to put testing off for a couple of
> > > > > > > weeks, as I
> > > > > > > > > > > have a road trip for work.
> > > > > > > > > > > > >
> > > > > > > > > > > > Cheers,
> > > > > > > > > > > > >
> > > > > > > > > > > > davidh
> > > > > > > > > > > > >
> > > > > > > > > > > > >
> > > > > > > > > > > > >
> > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam"
> > > > > > <swetterlin@>
> > > > > > > > > wrote:
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > David,
> > > > > > > > > > > > > > The only purpose of looking at the high end is to see
> > > > > > > whether
> > > > > > > > > > > there is some problem with the module that might also affect
> > > > > > > the low
> > > > > > > > > > > end, and we don't seem to have found any such problem. So
> > > > > > > maybe the
> > > > > > > > > > > abrupt flattening at the low end is due to the lack of
> > > > > > > shielding, as
> > > > > > > > > > > you originally suggested.
> > > > > > > > > > > > >
> > > > > > > > > > > > > If you try adjusting VMag, you'll find that your
> > > > > > efforts are
> > > > > > > > > > > largely defeated by the feedback loop. For example,
> > > > > > lowering VMag
> > > > > > > > > > > lowers the VGA gain, reducing the log amp input and
> > > > > > therefore the
> > > > > > > > > > > feedback voltage. The lower feedback voltage increases the
> > > > > > VGA
> > > > > > > gain,
> > > > > > > > > > > partially cancelling the effect of the original lowering of

> > > > > > > VMag. You
> > > > > > > > > > > > > get a similar effect if you adjust the feedback ratio.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > I suggest that you put the fencing and lid on the log
> > > > > > > > detector,
> > > > > > > > > > > > > > which is where shielding is the most important, and then
> > > > > > check
> > > > > > > > the
> > > > > > > > > > > low
> > > > > > > > > > > > > > end response.
> > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > I've been assuming you have the noise filter in place.
> > > > > > > > Is it
> > > > > > > > > > > the
> > > > > > > > > > > > > > > 500 kHz filter? Perhaps the only difference between your
> > > > > > > > response and
> > > > > > > > > > > > > > that in my paper is the noise filter width. I used 150
> > > > > > kHz. In
> > > > > > > > my MSA
> > > > > > > > > > > > > > I am using 500 kHz. I did not directly test the response
> > > > > > of the
> > > > > > > > > > > > > > Expanded Log Detector with that wider filter, but it did not
> > > > > > > > seem to
> > > > > > > > > > > > > > affect the lowest detectable signal level at the MSA input.
> > > > > > > > Possibly
> > > > > > > > > > > > > > the Expanded Log Detector's low end response would be
> > > > > > extended
> > > > > > > > with a
> > > > > > > > > > > > > narrower filter, but that extra range is not reachable with my
> > > > > > > > > > > > > narrowest RBW filter, which is now 2 kHz. Maybe a narrower
> > > > > > noise
> > > > > > > > > > > > filter would be useful when I install my 600 kHz amplifilter.
> > > > > > > > If so,
> > > > > > > > > > > > > I'll have to reconsider using the switchable noise filter,
> > > > > > which
> > > > > > > > > > would
> > > > > > > > > > > > > allow a wide noise filter for all RBW's except the
> > > > > > narrowest one,
> > > > > > > > > > > > where a much narrower one would kick in.
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > As a rough calculation, if you input to the MSA a
> > > > > > signal of
> > > > > > > > > > -115
> > > > > > > > > > > > dBm and have losses of 20 dB by the time you reach the IF2
> > > > > > > > amp, the
> > > > > > > > > > > > signal is -135 dBm at that point, -107 dBm at the output of
> > > > > > > > the 28 dB
> > > > > > > > > > > > amp, and perhaps -110 dBm at the output of the RBW filter.
> > > > > > At that
> > > > > > > > > > > > point the signal will be accompanied by noise from the amp

> > > > > > > (say, -174
> > > > > > > > > > > > dBm/Hz plus 4 created by the amp plus 28 due to
> > > > > amplification)
> > > > > > > equal
> > > > > > > > > > > to -142 dBm/Hz. With a 2 kHz RBW filter with 3 dB loss,
> > > > > that is
> > > > > > > > > > > -142+36-3=-109 dBm of noise, accompanying the -110 dBm
> > > > > signal. The
> > > > > > > > > > > signal would still be discernible, but there would any point
> > > > > > > in the
> > > > > > > > > > > Expanded Log Detector maintaining a strong response below the
> > > > > > > -109
> > > > > > > > > dBm
> > > > > > > > > > > noise level, which is about where yours (and maybe mine)
> > > > > peters
> > > > > > > > out. A
> > > > > > > > > > > narrower noise filter would therefore not be of much benefit.
> > > > > > > With a
> > > > > > > > > > > 600 Hz RBW filter, the noise level would be reduced by 5
> > > > > dB, so a
> > > > > > > > > > > narrower noise filter might increase the low end range by 5
> > > > > > > dB. Maybe
> > > > > > > > > > > not worth the effort.
> > > > > > > > > > > > >
> > > > > > > > > > > > > > (Note that a detector that dies below -110 dBm can
> > > > > still
> > > > > > > detect
> > > > > > > > > > > a -112 dBm signal if the signal is accompanied by enough
> > > > > noise to
> > > > > > > > > push
> > > > > > > > > > > the total signal+noise over -110 dBm. The noise actually
> > > > > provides
> > > > > > > > some
> > > > > > > > > > > benefit! The detector needs a range that extends down to
> > > > > the noise
> > > > > > > > > > > level, but the actual detectable signal will extend below the
> > > > > > > > > > > detector's nominal range.)
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > >
> > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > > <dhooke@> wrote:
> > > > > > > > > > > > >
> > > > > > > > > > > > > > Hi Sam,
> > > > > > > > > > > > >
> > > > > > > > > > > > > > To use an American expression, I've thrown you a

> > > > > curve
> > > > > > > ball.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > When I plot more samples and look closely at the raw
> > > > > > > data,
> > > > > > > > > > I'm
> > > > > > > > > > > > only in the "linear" range up until 0dBm input, which is
> > > > > > > pretty close
> > > > > > > > > > > to VDBS being 1.5V.
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > At +5dBm I'm reading about 2dB high at the LD output,
> > > > > > > as the
> > > > > > > > > > > slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB
> > > > > > > with my
> > > > > > > > > > > AGC/LD combination.
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > At 10dBm input limiting is taking place, I'm guessing
> > > > > > > as the
> > > > > > > > > > > AD8330 runs out of puff, and it just happens that this 10dBm
> > > > > > > > > sample is
> > > > > > > > > > > approximately in the same line as the data between -40 and
> > > > > > > 0dBm. If
> > > > > > > > > > > I'd gathered more samples in the first graph, this would
> > > > > have been
> > > > > > > > > > > much clearer. (memo to self...)
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > I'll adjust VMAG to get the overall AGC gain range
> > > > > correct
> > > > > > > > > > (15-65dB) and check that my system now functions per your
> > > > > paper.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > Many thanks for your help with this.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > davidh
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam"
> > > > > <swetterlin@>
> > > > > > > > > wrote:
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > David,
> > > > > > > > > > > > > > > > Your numbers seem correct. What confuses me is how
> > > > > > > you can
> > > > > > > > > > get such a good response with inputs up to 10 dBm.
> > > > > > > > > > > > > > >

> > > > > > > > > > > > > > > > > Per p. 16 of the data sheet, with VMag=1.2 and a
> > > > > > > load of
> > > > > > > > > > 200
> > > > > > > > > > > > ohms, the max voltage swing at the AD8330 output is +/-1.4V.
> > > > > > > > At the
> > > > > > > > > > > > transformer secondary, this would be halved to +/-0.7V.
> > > > > > That is 7
> > > > > > > > > > dBm.
> > > > > > > > > > > > With a gain of 6.8 dB, the AD8330 should start saturating
> > > > > > with an
> > > > > > > > > > > > input of 0.2 dBm. There would still be increased output with
> > > > > > > > > > increased
> > > > > > > > > > > > input (the output starts to square, but the fundamental
> > > > > > > > > content will
> > > > > > > > > > > > still increase), but the response should start to flatten at
> > > > > > > > > 0.2 dBm
> > > > > > > > > > > > input. Your response seems very linear well beyond that.
> > > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > > It seems odd to be worried about the circuit
> > > > > > > > > functioning
> > > > > > > > > > > too
> > > > > > > > > > > > > well at high input levels, but I wonder whether that is
> > > > > > connected
> > > > > > > > > > with
> > > > > > > > > > > > the low end not extending as far as it should.
> > > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > > > > <dhooke@> wrote:
> > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > > Sam,
> > > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > > Wilco on the 2k7, and yes, I have 10k/27k
> > > > > > giving an
> > > > > > > > > > > overall P of 0.68.
> > > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > > May I again check the VGA levels with you?
> > > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > > Looking only at voltage levels, with VDBS > 1.5V:
> > > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > > input xfmr: Av=4
> > > > > > > > > > > > > > > > > > > loss due to 3k9: Av=0.8
> > > > > > > > > > > > > > > > > > > VGA: Av=1
> > > > > > > > > > > > > > > > > > > Vmag: Av=2.4
> > > > > > > > > > > > > > > > > > > output resistors: Av=0.57

> > > > > > > > > > > > > > > > > > > output transformer: Av=0.5
> > > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > > This gives me an overall gain (50R to 50R) of
> > > > > 2.188 or
> > > > > > > > > > > > 6.8dB, which is exactly what I've measured.
> > > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > > What am I missing?
> > > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > > Thanks,
> > > > > > > > > > > > > > > > > > > >
> davidh
> > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > >
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7958. Re: [spectrumanalyzer] PLO blues (and blacks)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-15 22:06:46 UTC
From: Jurgen
Topic: 6664 Message: 7958

Hello Scotty,

Could you jog my memory please, what was the value of R23 on the PLO for the ADF4113.
I seem to remember 4.7k. Is that correct?

Thanks, Jurgen

On 8/29/2010 12:00 AM, william sprowls wrote:
>
> Hi Jim,
> Hopefully, Sam helped you fix your problem. I was going to advise to
> be sure to add R23 for the ADF4113. Same footprint as the LMX but it
> doesn't use R23.
> I think you are the first using the 4113. I will be interested to
> know the outcome of its total phase noise. It is supposed to exhibit a
> little less phase noise than the LMX. I'm guessing you might see a 1
> or 2 dB improvement.
> Scotty
>
> --- On *Sat, 8/28/10, jghbeta /<jghalpha@...>/* wrote:
>
>
> From: jghbeta <jghalpha@...>
> Subject: [spectrumanalyzer] PLO blues (and blacks)
> To: spectrumanalyzer@yahoogroups.com
> Date: Saturday, August 28, 2010, 10:57 AM
>
> Has anyone been succesful with the ADF4113 or 4112 instead of the LMX?
> I built my PLO3 with the ADF4113, including the extra resistor,
> and on start up it climbs the control voltage to the VCO from 0 to
> 22.2 volts and STAYS THERE. The 10.7 square signal from the DDS is
> identical to the one in PLO1 and all voltages and currents appear
> to be OK. Changing Modes does not change anything. I am truly stumped.
>
> Jim W1JGH
>
>
>

7959. Re: VGA Gain question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-15 22:29:00 UTC
From: Sam
Topic: 7837 Message: 7959

I have recalibrated my MSA due to all my recent tinkering. I posted a graph of the mag cal table for the amplifilter (600Hz) path:
<http://groups.yahoo.com/group/spectrumanalyzer/photos/album/271352628/pic/517713427/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>

The graph shows very nice linearity for the range from -109 dBm to -1 dBm, with some curvature outside that range. Response at the low end eventually becomes very poor due to noise. Response at the high end deteriorates largely because Mixer 1 starts to saturate, but the deterioration up to 8 dBm is not all that bad, at least for the purpose of measuring the power of a signal. (I have 3 dB attenuation in the RF input of Mixer 1, so 8 dBm at the MSA input becomes 5 dBm at the mixer.)

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I now have the switched noise filter properly shielded and installed in the MSA. It ties into the RBW Switch control lines. Here is my low end with various filters:
>
> RBW=600Hz NoiseFilt=75kHz LowEnd=-121 dBm
> RBW=8kHz NoiseFilt=75kHz LowEnd=-112 dBm
> RBW=60kHz NoiseFilt=1MHz LowEnd=-105 dBm
> RBW=400kHz NoiseFilt=1MHz LowEnd=-97 dBm
>
> In all cases the response tested well to +7 dBm, which is the highest level I can conveniently test.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > One further comment. I used a 28 dB IF2 amp instead of Scotty's 40 dB amp. I'm wary of blasting too much power through the RBW filters with high level MSA inputs. But if you are willing to go with the higher power through the filters, you can use the 40 dB amp with the Expanded Log Detector, and perhaps pick up another 10 dB on the low end, though you will possibly lose some of that from the high end.
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > And now for the final conclusion. I replaced the 150 kHz noise filter with 75 kHz, for a 3 dB bandwidth reduction. There was possibly a tiny improvement, with the low end maybe dropping by 1 dB to -120 dBm. But I think this indicates that there is nothing to be gained by making the noise filter bandwidth anything lower than 75 kHz, unless the RBW filter could also be narrowed.
> > >

> > > -120 dBm is nice round number, so I'm going with that as the low end. The highest level I tested is +7 dBm, so I have range of at least 127 dB. The response at +7 is still good, so it probably can do a bit more. At the high end there will be a lot of distortion, and I'm sure phase inaccuracy, but above 0 dBm it should still be good for power measurement of isolated signals.
> > >
> > > The 75 kHz noise filter bandwidth will not work with wide RBW filters. Even a 60 kHz RBW might not work because the ceramic noise filter might not be precisely centered at 10.7 MHz. But the 75 kHz noise filter is probably only effective with a very narrow RBW anyway. To utilize the narrow noise filter, it is necessary to use the switchable noise filter so a wider noise filter will kick in for the wider filters. My switchable noise filter has an op amp and a switch, because I was trying to avoid loss. It turns out that loss in the noise filter is of little concern, since it just has the effect of cranking up the VGA gain. I actually have mine set with fairly low op amp gain, so there is a fair amount of loss.
> > >
> > > I designed a newer switchable noise filter that uses a switch but omits the op amp. It could probably be further simplified because the narrow noise filter can be used with the two narrowest filters, and the wide filter with the others (my wide filter will become 1 MHz). If the filters are addressed 0-3 starting from the widest (that's how it is done on the unified RBW board), that means the switching can be done with an SPDT driven by the "2" bit of the address, and the "1" bit can be ignored.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >
> > > > Here is the state of the experiment so far. I replaced the 2 kHz RBW filter with the 600 Hz amplifiliter. Low end remained about -114 dBm. This indicated the bottleneck is the noise filter. Started to replace the 500 kHz noise filter with the 2 kHz filter, then remembered the amplifilter is centered at 10.693 MHz and the 2 kHz filter is at 10.7 MHz, so the pass bands don't overlap. Found a ceramic filter that was about 150 kHz BW and used it as the noise filter. Low end dropped to -119 dBm. Still gets good response at +7 dBm at MSA input. That's a range of 126 dB.
> > > >
> > > > Low end was measured as the level at which the slope of ADC value per dB dropped to 10.
> > > >
> > > > The drop in the low end was proportional to the reduction in noise filter bandwidth (10*log(500kHz/150kHz)=5.2 dB). This suggests that there is more to be gained by an even narrower noise filter. I will see what I can rig up.
> > > >
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@> wrote:
> > > > >
> > > > > You might remember initially I used the 60kHz ceramic filter as a noise
> > > > > filter then after some deliberation I changed it back to 600 kHz.
> > > > > According to my record this extended the low range by an additional 5dB.
> > > > > I am looking forward to the results of putting a 2kHz filter into its place.
> > > > > Jurgen

> > > > >
> > > > > On 4/10/2011 10:29 AM, Sam wrote:
> > > > > >
> > > > > > You can't pin down the full range until you have the full chain of IF2
> > > > > > Amp--RBW filter--VGA--Noise Filter--Log Detector. The narrowness of
> > > > > > the RBW filter and noise filter affects the low end range up to a
> > > > > > point. Narrowing a filter improves the range only if that filter is
> > > > > > the bottleneck in the noise reduction plan. To see how far you can
> > > > > > extend the range, it is probably best to start with very narrow
> > > > > > filters. If it turns out, for example, that very narrow filters have a
> > > > > > range of only 5 dB more than you get with wider filters, you might
> > > > > > decide the using the switchable noise filter is not worth the trouble.
> > > > > > >
> > > > > > > When I did my testing, I did not have an extremely narrow RBW filter,
> > > > > > > nor did I try a noise filter narrower than 60 kHz. Now that I have the
> > > > > > > 600 Hz amplifilter, I plan to use it to replace my 2 kHz RBW filter,
> > > > > > > which I can then try as the noise filter. (The noise filter does not
> > > > > > > have anywhere near as much attenuation as the RBW filters, but an
> > > > > > > extra RBW filter is convenient to use for an experiment.)
> > > > > > > Sam W.
> > > > > > > >
> > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@> wrote:
> > > > > > > > >
> > > > > > > > > Sam,
> > > > > > > > > >
> > > > > > > > > > Are you talking about the filter bandwidth within the VGA chain?
> > > > > > > > > > Remember my tests include the VGA chain only.
> > > > > > > > > > I am just getting into it again. Work gets into the way.
> > > > > > > > > > I finally have my new scope going, probing etc.
> > > > > > > > > > I also have the PCB's I promised, the size turned out ~ 1mm larger than
> > > > > > > > > > the others. Don't why looks like I did not pay attention.
> > > > > > > > > > I will ship them soon.
> > > > > > > > > >
> > > > > > > > > > Jurgen
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > > On 4/9/2011 9:35 AM, Sam wrote:
> > > > > > > > > > >
> > > > > > > > > > > Jurgen,
> > > > > > > > > > > The main potential for greater range is the use of very narrow RBW
> > > > > > > > > > > filters and/or a narrow noise filter. I would expect that the
> > > > > > > > > > > combination of an RBW filter below 1 kHz with a noise filter of 7.5
> > > > > > > > > > > kHz would improve the low end. That would of course require using a
> > > > > > > > > > > switchable noise filter, though as an experiment you could manually
> > > > > > > > > > > swap the noise filters. I have not tried these narrow filters.
> > > > > > > > > > > Sam W.
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com

> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@> wrote:
> > > > > > > > >
> > > > > > > > > > Hello David,
> > > > > > > > > >
> > > > > > > > > > Thanks for your reply. I logged about 14 different test
> > > > > > > combination in
> > > > > > > > > > an Excel spread sheet and it looks like that one is stuck with a
> > > > > > > certain
> > > > > > > > > > max linear range of about 110 dB in this circuit. No matter what I
> > > > > > > tried
> > > > > > > > > > could not get past it.
> > > > > > > > > > I thought the there was a possibility to expand the top end but ran
> > > > > > > into
> > > > > > > > > > limitations.
> > > > > > > > > > I finally settled for this result. I am using a 500 kHz ceramic
> > > > > > > filter
> > > > > > > > > > within the chain.
> > > > > > > > > >
> > > > > > > > > > Jurgen
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > > On 4/9/2011 3:13 AM, davidhooau wrote:
> > > > > > > > > >
> > > > > > > > > > Hi Jurgen,
> > > > > > > > > >
> > > > > > > > > > I saw very similar results to those shown in Sam's paper. I'm
> > > > > > > going to
> > > > > > > > > > play a few more testing games, and then I'll get some results
> > > > > > > graphed
> > > > > > > > > > to more definitively answer your (and my own) question.
> > > > > > > > > >
> > > > > > > > > > As expected, the was a big improvement using an RBW filter at the
> > > > > > > > > > input, compared with my earlier tests without. I only have the
> > > > > > > 600Hz
> > > > > > > > > > amplifilter working at the moment but expect to add additional
> > > > > > > filters
> > > > > > > > > > in the next few week.
> > > > > > > > > >
> > > > > > > > > > HTH.
> > > > > > > > > >
> > > > > > > > > > davidh
> > > > > > > > > >
> > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@>
> > > > > > wrote:
> > > > > > > > > > >

> > > > > > > > > > > David one more question,
> > > > > > > > > > > > What is your linearity within this range?
> > > > > > > > > > > >
> > > > > > > > > > > > Jurgen
> > > > > > > > > > > >
> > > > > > > > > > > > On 4/8/2011 8:19 AM, Sam wrote:
> > > > > > > > > > > >
> > > > > > > > > > > > > It would be interesting to see what effect that has, but I
> > > > > > > > > > doubt it
> > > > > > > > > > > > > will affect your range significantly, and it may actually
> > > > > > > > > reduce the
> > > > > > > > > > > > > range. Efficiency of power transfer is not a big issue at
> > > > > > the VGA
> > > > > > > > > > > > > output (recall that I actually put an attenuator on the noise
> > > > > > > > > filter),
> > > > > > > > > > > > > so perfect impedance matching is not necessary.
> > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > >
> > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > > > <dhooke@>
> > > > > > > > > > > > wrote:
> > > > > > > > > > > >
> > > > > > > > > > > > > Hi Sam and other VGA users,
> > > > > > > > > > > >
> > > > > > > > > > > > > I've retested with RBW filters in place, and I'm happy the
> > > > > > > > expanded
> > > > > > > > > > > > > log system is working correctly (and that I understand it).
> > > > > > > > With the
> > > > > > > > > > > > > 600Hz filter, I'm getting close to 118dB range before the LD
> > > > > > > > starts to
> > > > > > > > > > > > > plateau.
> > > > > > > > > > > >
> > > > > > > > > > > > > Before I nail it all shut, should I replace the VGA output
> > > > > > > > > > > > > transformer with a 3:1 Z ratio unit to improve the output
> > > > > > > > matching?
> > > > > > > > > > > >
> > > > > > > > > > > > > Thanks,
> > > > > > > > > > > >
> > > > > > > > > > > > > davidh
> > > > > > > > > > > >
> > > > > > > > > > > >
> > > > > > > > > > > >
> > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>

> > > > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > > > > > <dhooke@> wrote:
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Hi Sam,
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > Yes, I'm using the 500kHz noise filter we were tuning
> > > > > > a few
> > > > > > > > > > days ago.
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > I've posted a slightly clearer graph, including the LD
> > > > > > alone,
> > > > > > > > > with
> > > > > > > > > > > > some additional samples to clarify things. Now, at the
> > > > > > upper limit
> > > > > > > > > > > > between 0dBm and 5dBm, you can see the slope increase as
> > > > > > we run
> > > > > > > > > out of
> > > > > > > > > > > > AGC range, and then the LD run out of range, making the 10dBm
> > > > > > sample
> > > > > > > > > > > > look better than it really is.
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > For reference, the minimum AGC gain is now 7dB, the NF is
> > > > > > 500kHz
> > > > > > > > > > > > wide with an insertion loss of 4dB. The net division ratio
> > > > > > from LD to
> > > > > > > > > > > > VDBS is 0.68 and the ADC is connected per your current drawing
> > > > > > > > > > > > (between the 2k7 and 10k-27k on the AGC unit).
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > I'm going to have to put testing off for a couple of
> > > > > > weeks, as I
> > > > > > > > > > > > have a road trip for work.
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > Cheers,
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > davidh
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam"
> > > > > > <swetterlin@>
> > > > > > > > > > wrote:
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > David,
> > > > > > > > > > > > > > > > The only purpose of looking at the high end is to see
> > > > > > > > > whether
> > > > > > > > > > > > there is some problem with the module that might also affect

> > > > > > > > the low
> > > > > > > > > > > > > end, and we don't seem to have found any such problem. So
> > > > > > > > > maybe the
> > > > > > > > > > > > > abrupt flattening at the low end is due to the lack of
> > > > > > > > > shielding, as
> > > > > > > > > > > > > you originally suggested.
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > If you try adjusting VMag, you'll find that your
> > > > > > > efforts are
> > > > > > > > > > > > > largely defeated by the feedback loop. For example,
> > > > > > > lowering VMag
> > > > > > > > > > > > > lowers the VGA gain, reducing the log amp input and
> > > > > > > therefore the
> > > > > > > > > > > > > feedback voltage. The lower feedback voltage increases the
> > > > > > > VGA
> > > > > > > > > > > gain,
> > > > > > > > > > > > > partially cancelling the effect of the original lowering of
> > > > > > > > > > VMag. You
> > > > > > > > > > > > > get a similar effect if you adjust the feedback ratio.
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > I suggest that you put the fencing and lid on the log
> > > > > > > > > detector,
> > > > > > > > > > > > > which is where shielding is the most important, and then
> > > > > > > check
> > > > > > > > > the
> > > > > > > > > > > > low
> > > > > > > > > > > > > end response.
> > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > I've been assuming you have the noise filter in place.
> > > > > > > > > Is it
> > > > > > > > > > > > the
> > > > > > > > > > > > > 500 kHz filter? Perhaps the only difference between your
> > > > > > > > > response and
> > > > > > > > > > > > > that in my paper is the noise filter width. I used 150
> > > > > > > kHz. In
> > > > > > > > > my MSA
> > > > > > > > > > > > > I am using 500 kHz. I did not directly test the response
> > > > > > > of the
> > > > > > > > > > > > > Expanded Log Detector with that wider filter, but it did not
> > > > > > > > > seem to
> > > > > > > > > > > > > affect the lowest detectable signal level at the MSA input.
> > > > > > > > > Possibly
> > > > > > > > > > > > > the Expanded Log Detector's low end response would be
> > > > > > > extended
> > > > > > > > > with a
> > > > > > > > > > > > > narrower filter, but that extra range is not reachable with my
> > > > > > > > > > > > > narrowest RBW filter, which is now 2 kHz. Maybe a narrower
> > > > > > > noise
> > > > > > > > > > > > > filter would be useful when I install my 600 kHz amplifilter.
> > > > > > > > > If so,

> > > > > > > > > > > > I'll have to reconsider using the switchable noise filter,
> > > > > > which
> > > > > > > > > > would
> > > > > > > > > > > > allow a wide noise filter for all RBW's except the
> > > > > > narrowest one,
> > > > > > > > > > > > where a much narrower one would kick in.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > As a rough calculation, if you input to the MSA a
> > > > > > signal of
> > > > > > > > > > -115
> > > > > > > > > > > > dBm and have losses of 20 dB by the time you reach the IF2
> > > > > > > > amp, the
> > > > > > > > > > > > signal is -135 dBm at that point, -107 dBm at the output of
> > > > > > > > the 28 dB
> > > > > > > > > > > > amp, and perhaps -110 dBm at the output of the RBW filter.
> > > > > > At that
> > > > > > > > > > > > point the signal will be accompanied by noise from the amp
> > > > > > > > (say, -174
> > > > > > > > > > > > dBm/Hz plus 4 created by the amp plus 28 due to
> > > > > > amplification)
> > > > > > > > equal
> > > > > > > > > > > > to -142 dBm/Hz. With a 2 kHz RBW filter with 3 dB loss,
> > > > > > that is
> > > > > > > > > > > > -142+36-3=-109 dBm of noise, accompanying the -110 dBm
> > > > > > signal. The
> > > > > > > > > > > > signal would still be discernible, but there would any point
> > > > > > > > in the
> > > > > > > > > > > > Expanded Log Detector maintaining a strong response below the
> > > > > > > > -109
> > > > > > > > > > dBm
> > > > > > > > > > > > noise level, which is about where yours (and maybe mine)
> > > > > > peters
> > > > > > > > > > out. A
> > > > > > > > > > > > narrower noise filter would therefore not be of much benefit.
> > > > > > > > With a
> > > > > > > > > > > > 600 Hz RBW filter, the noise level would be reduced by 5
> > > > > > dB, so a
> > > > > > > > > > > > narrower noise filter might increase the low end range by 5
> > > > > > > > dB. Maybe
> > > > > > > > > > > > not worth the effort.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > (Note that a detector that dies below -110 dBm can
> > > > > > still
> > > > > > > > detect
> > > > > > > > > > > > a -112 dBm signal if the signal is accompanied by enough
> > > > > > noise to
> > > > > > > > > push
> > > > > > > > > > > > the total signal+noise over -110 dBm. The noise actually
> > > > > > provides
> > > > > > > > > > some

> > > > > > > > > > > > benefit! The detector needs a range that extends down to
> > > > > > the noise
> > > > > > > > > > > > level, but the actual detectable signal will extend below the
> > > > > > > > > > > > detector's nominal range.)
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"
> > > > > > > > > > <dhooke@> wrote:
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > Hi Sam,
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > To use an American expression, I've thrown you a
> > > > > > curve
> > > > > > > > ball.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > When I plot more samples and look closely at the raw
> > > > > > > > data,
> > > > > > > > > > I'm
> > > > > > > > > > > > > only in the "linear" range up until 0dBm input, which is
> > > > > > > > pretty close
> > > > > > > > > > > > to VDBS being 1.5V.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > At +5dBm I'm reading about 2dB high at the LD output,
> > > > > > > > as the
> > > > > > > > > > > > slope is now that of the AD8306 alone, 0.02V/dB vs. 0.013V/dB
> > > > > > > > with my
> > > > > > > > > > > AGC/LD combination.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > At 10dBm input limiting is taking place, I'm guessing
> > > > > > > > as the
> > > > > > > > > > > > AD8330 runs out of puff, and it just happens that this 10dBm
> > > > > > > > sample is
> > > > > > > > > > > > approximately in the same line as the data between -40 and
> > > > > > > > 0dBm. If
> > > > > > > > > > > > I'd gathered more samples in the first graph, this would
> > > > > > have been
> > > > > > > > > > > > much clearer. (memo to self...)
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > I'll adjust VMAG to get the overall AGC gain range
> > > > > > correct
> > > > > > > > > > > > (15-65dB) and check that my system now functions per your
> > > > > > paper.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > Many thanks for your help with this.
> > > > > > > > > > > > > > >

> > > > > > > > > > > > > > > > > davidh
> > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam"
> > > > > > > <swetterlin@>
> > > > > > > > > > > > wrote:
> > > > > > > > > > > > > > > > > > > >
> David,
> Your numbers seem correct. What confuses me is how
> > > > > > > > > > you can
> > > > > > > > > > > > > > > > > > get such a good response with inputs up to 10 dBm.
> >
> Per p. 16 of the data sheet, with VMag=1.2 and a
> > > > > > > > > > > > load of
> > > > > > > > > > > > > 200
> > > > > > > > > > > > > > > > > > ohms, the max voltage swing at the AD8330 output is +/-1.4V.
> > > > > > > > > > > > At the
> > > > > > > > > > > > > > > > > > transformer secondary, this would be halved to +/-0.7V.
> > > > > > > > > > That is 7
> > > > > > > > > > > > > > > > dBm.
> With a gain of 6.8 dB, the AD8330 should start saturating
> > > > > > > > > > with an
> > > > > > > > > > > > > > > > > > input of 0.2 dBm. There would still be increased output with
> > > > > > > > > > > > > > > > increased
> input (the output starts to square, but the fundamental
> > > > > > > > > > > > content will
> > > > > > > > > > > > > > > > > > still increase), but the response should start to flatten at
> > > > > > > > > > > > > 0.2 dBm
> input. Your response seems very linear well beyond that.
> >
> It seems odd to be worried about the circuit
> > > > > > > > > > > > > functioning
> > > > > > > > > > > > > > > > > too
> well at high input levels, but I wonder whether that is
> > > > > > > > > > connected
> > > > > > > > > > > > > > > > with
> the low end not extending as far as it should.
> >
> Sam W.
> >
> --- In spectrumanalyzer@yahoogroups.com
> > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > > > > > > > > > > > > > > > <mailto:spectrumanalyzer%40yahoogroups.com>, "davidhooau"

> > > > > > > > > > <dhooke@> wrote:
> >
> Sam,
> >
> Wilco on the 2k7, and yes, I have 10k/27k
> > > > > > > giving an
> > > > > > > > > > > > > overall P of 0.68.
> >
> May I again check the VGA levels with you?
> >
> Looking only at voltage levels, with VDBS > 1.5V:
> >
> input xfmr: Av=4
> loss due to 3k9: Av=0.8
> VGA: Av=1
> Vmag: Av=2.4
> output resistors: Av=0.57
> output transformer: Av=0.5
> >
> This gives me an overall gain (50R to 50R) of
> > > > > > > 2.188 or
> > > > > > > > > > > > > > 6.8dB, which is exactly what I've measured.
> >
> What am I missing?
> >
> Thanks,
> >
> davidh
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7960. Re: [spectrumanalyzer] PLO blues (and blacks)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-16 03:03:37 UTC
From: william sprowls
Topic: 6664 Message: 7960

Hi Jurgen,
 Yes, 4.7 K is correct.
Scotty

--- On Fri, 4/15/11, Jurgen <khj221@...> wrote:

From: Jurgen <khj221@...>
Subject: Re: [spectrumanalyzer] PLO blues (and blacks)
To: spectrumanalyzer@yahoogroups.com
Date: Friday, April 15, 2011, 5:06 PM

Hello Scotty,

Could you jog my memory please, what was the value of R23 on the PLO
for the ADF4113.

I seem to remember 4.7k. Is that correct?

Thanks, Jurgen

On 8/29/2010 12:00 AM, william sprowls wrote:

Hi Jim,

 Hopefully, Sam helped you fix your problem. I was
going to advise to be sure to add R23 for the
ADF4113. Same footprint as the LMX but it doesn't
use R23.

 I think you are the first using the 4113. I will
be interested to know the outcome of its total
phase noise. It is supposed to exhibit a little
less phase noise than the LMX. I'm guessing you
might see a 1 or 2 dB improvement.

Scotty

--- On Sat, 8/28/10, jghbeta <jghalpha@...>
wrote:

From: jghbeta <jghalpha@...>

Subject: [spectrumanalyzer] PLO blues (and
blacks)

To: spectrumanalyzer@yahoogroups.com

Date: Saturday, August 28, 2010, 10:57 AM

Has anyone been succesful with the ADF4113 or 4112 instead of the LMX?

I built my PLO3 with the ADF4113, including the extra resistor, and on start up it climbs the control voltage to the VCO from 0 to 22.2 volts and STAYS THERE. The 10.7 square signal from the DDS is identical to the one in PLO1 and all voltages and currents appear to be OK. Changing Modes does not change anything. I am truly stumped.

Jim W1JGH

7961. Initial Cal

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-16 17:04:49 UTC
From: Sam
Topic: 7961 Message: 7961

Having just re-calibrated, I went through my document describing the process and made changes/corrections. I updated the document InitialCal.pdf in the Files section.

For one thing, I previously described frequency calibration before path calibration, but you need to have at least a partial path calibration before the frequency calibration will be valid.

I previously described complications involving the zero-hump or zero-response, which can require doing low level phase calibrations at a higher frequency. Now I note that this is not an issue if you install the optional LO2 Isolation Amp.

It is handy to do magnitude calibration and phase calibration separately. During magnitude calibration, it is nice to be able to force the phase correction to zero, or in the case of very low signal levels, to 180. A phase correction of 180 signals the MSA that phase measurement at that level is not meaningful, so it will be graphed as zero. The new software will have a mechanism to force the phase correction to a desired value, so you don't have to manually change all the entries.

Speaking of the new software, as far as I'm concerned it is ready for release. But if anyone knows of any bugs in the beta software, please let me know. Particularly with regard to USB, which I am currently not able to test.

Sam W.

7962. Re: [spectrumanalyzer] PLO blues (and blacks)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-18 18:35:03 UTC
From: Jurgen
Topic: 6664 Message: 7962

Hello Scotty,

Another question. I build all three PLO's identical ("standard PLO"). An oversight on my part.

I can not make the "standard PLO" work in the PLO2 slot. It either latches at 2.1 GHz or 800 some MHz with distorted waveform. It flip flops. Is it possible that the code would have to changed to accommodate a "standard PLO"?

I have +20V connected. I see data bits on the clock line and data line but none on LE, it is low.
Looking at the data sheet data is transferred during a positive transition on LE.
I understand from Sam that LE is activated during initialization only.

Thanks for your help, Jurgen

On 4/15/2011 11:03 PM, william sprowls wrote:
>
> Hi Jurgen,
> Yes, 4.7 K is correct.
> Scotty
>
> --- On *Fri, 4/15/11, Jurgen /<khj221@...>/* wrote:
>
>
> From: Jurgen <khj221@...>
> Subject: Re: [spectrumanalyzer] PLO blues (and blacks)
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, April 15, 2011, 5:06 PM
>
> Hello Scotty,
>
> Could you jog my memory please, what was the value of R23 on the
> PLO for the ADF4113.
> I seem to remember 4.7k. Is that correct?
>
> Thanks, Jurgen
>
>
>
>
> On 8/29/2010 12:00 AM, william sprowls wrote:
>
>> Hi Jim,

>> Hopefully, Sam helped you fix your problem. I was going to
>> advise to be sure to add R23 for the ADF4113. Same footprint as
>> the LMX but it doesn't use R23.
>> I think you are the first using the 4113. I will be interested
>> to know the outcome of its total phase noise. It is supposed to
>> exhibit a little less phase noise than the LMX. I'm guessing you
>> might see a 1 or 2 dB improvement.
>> Scotty
>>
>> --- On *Sat, 8/28/10, jghbeta /<jghalpha@...>
>> </mc/compose?to=jghalpha@...>/* wrote:
>>
>>
>> From: jghbeta <jghalpha@...>
>> </mc/compose?to=jghalpha@...>
>> Subject: [spectrumanalyzer] PLO blues (and blacks)
>> To: spectrumanalyzer@yahoogroups.com
>> </mc/compose?to=spectrumanalyzer@yahoogroups.com>
>> Date: Saturday, August 28, 2010, 10:57 AM
>>
>> Has anyone been succesful with the ADF4113 or 4112 instead of
>> the LMX?
>> I built my PLO3 with the ADF4113, including the extra
>> resistor, and on start up it climbs the control voltage to
>> the VCO from 0 to 22.2 volts and STAYS THERE. The 10.7 square
>> signal from the DDS is identical to the one in PLO1 and all
>> voltages and currents appear to be OK. Changing Modes does
>> not change anything. I am truly stumped.
>>
>> Jim W1JGH
>>
>>
>

7963. Re: [spectrumanalyzer] PLO blues (and blacks)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-18 19:04:47 UTC
From: William Dillon
Topic: 6664 Message: 7963

I hope I can answer this question correctly...

If you build PLO2 with an opamp, then it's "inverting" and you need to change that in the hardware configuration settings in the Spectrum Analyzer software. This is a flag that must be set in the PLL chip so it inverts the charge pump output.

On Apr 18, 2011, at 11:35 AM, Jurgen wrote:

> Hello Scotty,
>
> Another question. I build all three PLO's identical ("standard PLO"). An oversight on my part.
>
> I can not make the "standard PLO" work in the PLO2 slot. It either latches at 2.1 GHz or 800 some MHz with distorted waveform. It flip flops.
> Is it possible that the code would have to changed to accommodate a "standard PLO"?
>
> I have +20V connected. I see data bits on the clock line and data line but none on LE, it is low.
> Looking at the data sheet data is transferred during a positive transition on LE.
> I understand from Sam that LE is activated during initialization only.
>
> Thanks for your help, Jurgen
>
>
>
>
>
> On 4/15/2011 11:03 PM, william sprowls wrote:
>
>>
>> Hi Jurgen,
>> Yes, 4.7 K is correct.
>> Scotty
>>
>> --- On Fri, 4/15/11, Jurgen <khj221@...> wrote:
>>
>> From: Jurgen <khj221@bellsouth.net>
>> Subject: Re: [spectrumanalyzer] PLO blues (and blacks)
>> To: spectrumanalyzer@yahoogroups.com
>> Date: Friday, April 15, 2011, 5:06 PM
>>
>>
>> Hello Scotty,
>>
>> Could you jog my memory please, what was the value of R23 on the PLO for the ADF4113.

>> I seem to remember 4.7k. Is that correct?
>>
>> Thanks, Jurgen
>>
>>
>>
>>
>> On 8/29/2010 12:00 AM, william sprowls wrote:
>>
>>>
>>> Hi Jim,
>>> Hopefully, Sam helped you fix your problem. I was going to advise to be sure to add R23 for the ADF4113. Same footprint as the LMX but it doesn't use R23.
>>> I think you are the first using the 4113. I will be interested to know the outcome of its total phase noise. It is supposed to exhibit a little less phase noise than the LMX. I'm guessing you might see a 1 or 2 dB improvement.
>>> Scotty
>>>
>>> --- On Sat, 8/28/10, jghbeta <jghalpha@...> wrote:
>>>
>>> From: jghbeta <jghalpha@...>
>>> Subject: [spectrumanalyzer] PLO blues (and blacks)
>>> To: spectrumanalyzer@yahoogroups.com
>>> Date: Saturday, August 28, 2010, 10:57 AM
>>>
>>>
>>> Has anyone been succesful with the ADF4113 or 4112 instead of the LMX?
>>> I built my PLO3 with the ADF4113, including the extra resistor, and on start up it climbs the control voltage to the VCO from 0 to 22.2 volts and STAYS THERE. The 10.7 square signal from the DDS is identical to the one in PLO1 and all voltages and currents appear to be OK. Changing Modes does not change anything. I am truly stumped.
>>>
>>> Jim W1JGH
>>>
>>>
>
>

7964. Re: PLO blues (and blacks)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-18 19:12:53 UTC
From: Sam
Topic: 6664 Message: 7964

Good point, Will. Jurgen, in the Configuration Manager you need to set the PLL2 "polarity" to match that of PLL1 and 3. Ignore the "invert" and "non-inv" labels, which we recently realized are reversed. Just make PLL2 match PLL1.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> I hope I can answer this question correctly...
>
> If you build PLO2 with an opamp, then it's "inverting" and you need to change that in the hardware configuration settings in the Spectrum Analyzer software. This is a flag that must be set in the PLL chip so it inverts the charge pump output.
>
>
>
> On Apr 18, 2011, at 11:35 AM, Jurgen wrote:
>
> > Hello Scotty,
> >
> > Another question. I build all three PLO's identical ("standard PLO"). An oversight on my part.
> >
> > I can not make the "standard PLO" work in the PLO2 slot. It either latches at 2.1 GHz or 800 some MHz with distorted waveform. It flip flops.
> > Is it possible that the code would have to changed to accommodate a "standard PLO"?
> >
> > I have +20V connected. I see data bits on the clock line and data line but none on LE, it is low.
> > Looking at the data sheet data is transferred during a positive transition on LE.
> > I understand from Sam that LE is activated during initialization only.
> >
> > Thanks for your help, Jurgen
> >
> >
> >
> >
> >
> > On 4/15/2011 11:03 PM, william sprowls wrote:
> >
> >>
> >> Hi Jurgen,
> >> Yes, 4.7 K is correct.
> >> Scotty
> >>
> >> --- On Fri, 4/15/11, Jurgen <khj221@...> wrote:

> >>
> >> From: Jurgen <khj221@...>
> >> Subject: Re: [spectrumanalyzer] PLO blues (and blacks)
> >> To: spectrumanalyzer@yahoogroups.com
> >> Date: Friday, April 15, 2011, 5:06 PM
> >>
> >>
> >> Hello Scotty,
> >>
> >> Could you jog my memory please, what was the value of R23 on the PLO for the ADF4113.
> >> I seem to remember 4.7k. Is that correct?
> >>
> >> Thanks, Jurgen
> >>
> >>
> >>
> >>
> >> On 8/29/2010 12:00 AM, william sprowls wrote:
> >>
> >>>
> >>> Hi Jim,
> >>> Hopefully, Sam helped you fix your problem. I was going to advise to be sure to add R23 for the ADF4113. Same footprint as the LMX but it doesn't use R23.
> >>> I think you are the first using the 4113. I will be interested to know the outcome of its total phase noise. It is supposed to exhibit a little less phase noise than the LMX. I'm guessing you might see a 1 or 2 dB improvement.
> >>> Scotty
> >>>
> >>> --- On Sat, 8/28/10, jghbeta <jghalpha@...> wrote:
> >>>
> >>> From: jghbeta <jghalpha@...>
> >>> Subject: [spectrumanalyzer] PLO blues (and blacks)
> >>> To: spectrumanalyzer@yahoogroups.com
> >>> Date: Saturday, August 28, 2010, 10:57 AM
> >>>
> >>>
> >>> Has anyone been succesful with the ADF4113 or 4112 instead of the LMX?
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> >>>
> >>> Jim W1JGH
> >>>
> >>>
> >
> >
>

7965. Re: [spectrumanalyzer] PLO blues (and blacks)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-18 19:18:39 UTC
From: Jurgen
Topic: 6664 Message: 7965

Thanks, William.
That certainly makes sense, the Op amp is inverting. I hope this is all
that needs to be done.
Now I have to equip myself with the compiler, source code etc. etc.

Jurgen

On 4/18/2011 3:04 PM, William Dillon wrote:
>
> I hope I can answer this question correctly...
>
>
> If you build PLO2 with an opamp, then it's "inverting" and you need to
> change that in the hardware configuration settings in the Spectrum
> Analyzer software. This is a flag that must be set in the PLL chip so
> it inverts the charge pump output.
>
>
>
> On Apr 18, 2011, at 11:35 AM, Jurgen wrote:
>
>> Hello Scotty,
>>
>> Another question. I build all three PLO's identical ("standard PLO").
>> An oversight on my part.
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>> I can not make the "standard PLO" work in the PLO2 slot. It either
>> latches at 2.1 GHz or 800 some MHz with distorted waveform. It flip
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>> Thanks for your help, Jurgen
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>>
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>> On 4/15/2011 11:03 PM, william sprowls wrote:

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>>> Hi Jurgen,
>>> Yes, 4.7 K is correct.
>>> Scotty
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>>> --- On *Fri, 4/15/11, Jurgen /<khj221@...>/* wrote:
>>>
>>>
>>> From: Jurgen <khj221@...>
>>> Subject: Re: [spectrumanalyzer] PLO blues (and blacks)
>>> To: spectrumanalyzer@yahoogroups.com
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>>> Hello Scotty,
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>>>> --- On *Sat, 8/28/10, jghbeta /<jghalpha@...>
>>>> <x-msg://181/mc/compose?to=jghalpha@...>/* wrote:
>>>>
>>>>
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>>>> <x-msg://181/mc/compose?to=jghalpha@...>
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>>>> Jim W1JGH
>>>>
>>>>
>>
>
>

7966. Re: [spectrumanalyzer] Re: PLO blues (and blacks)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-18 21:00:07 UTC
From: Jurgen
Topic: 6664 Message: 7966

Thanks, sounds good. Made the change, I glad I don't have to get into
the code.
Will retest later.

Jurgen

On 4/18/2011 3:12 PM, Sam wrote:
>
> Good point, Will. Jurgen, in the Configuration Manager you need to set
> the PLL2 "polarity" to match that of PLL1 and 3. Ignore the "invert"
> and "non-inv" labels, which we recently realized are reversed. Just
> make PLL2 match PLL1.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, William Dillon
> <hpux735@...> wrote:
> >
> > I hope I can answer this question correctly...
> >
> > If you build PLO2 with an opamp, then it's "inverting" and you need
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> Analyzer software. This is a flag that must be set in the PLL chip so
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> > >> --- On Fri, 4/15/11, Jurgen <khj221@...> wrote:
> > >>
> > >> From: Jurgen <khj221@...>
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> > >> To: spectrumanalyzer@yahoogroups.com
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> > >>> Hi Jim,
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> LMX but it doesn't use R23.
> > >>> I think you are the first using the 4113. I will be interested
> to know the outcome of its total phase noise. It is supposed to
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> see a 1 or 2 dB improvement.
> > >>> Scotty
> > >>>
> > >>> --- On Sat, 8/28/10, jghbeta <jghalpha@...> wrote:
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> > >>> From: jghbeta <jghalpha@...>
> > >>> Subject: [spectrumanalyzer] PLO blues (and blacks)

> > >>> To: spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>
> > >>> Date: Saturday, August 28, 2010, 10:57 AM
> > >>>
> > >>>
> > >>> Has anyone been succesful with the ADF4113 or 4112 instead of
> the LMX?
> > >>> I built my PLO3 with the ADF4113, including the extra resistor,
> and on start up it climbs the control voltage to the VCO from 0 to
> 22.2 volts and STAYS THERE. The 10.7 square signal from the DDS is
> identical to the one in PLO1 and all voltages and currents appear to
> be OK. Changing Modes does not change anything. I am truly stumped.
> > >>>
> > >>> Jim W1JGH
> > >>>
> > >>>
> > >
> > >
> >
>
>

7967. Re: [spectrumanalyzer] PLO blues (and blacks)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-18 20:57:47 UTC
From: William Dillon
Topic: 6664 Message: 7967

I don't think so... I think you can just change it in the application

On Apr 18, 2011, at 12:18 PM, Jurgen wrote:

> Thanks, William.
> That certainly makes sense, the Op amp is inverting. I hope this is all that needs to be done.
> Now I have to equip myself with the compiler, source code etc. etc.
>
> Jurgen
>
>
> On 4/18/2011 3:04 PM, William Dillon wrote:
>
>>
>> I hope I can answer this question correctly...
>>
>>
>> If you build PLO2 with an opamp, then it's "inverting" and you need to change that in the hardware configuration settings in the Spectrum Analyzer software. This is a flag that must be set in the PLL chip so it inverts the charge pump output.
>>
>>
>>
>> On Apr 18, 2011, at 11:35 AM, Jurgen wrote:
>>
>>>
>>> Hello Scotty,
>>>
>>> Another question. I build all three PLO's identical ("standard PLO"). An oversight on my part.
>>>
>>> I can not make the "standard PLO" work in the PLO2 slot. It either latches at 2.1 GHz or 800 some MHz with distorted waveform. It flip flops.
>>> Is it possible that the code would have to changed to accommodate a "standard PLO"?
>>>
>>> I have +20V connected. I see data bits on the clock line and data line but none on LE, it is low.
>>> Looking at the data sheet data is transferred during a positive transition on LE.
>>> I understand from Sam that LE is activated during initialization only.
>>>
>>> Thanks for your help, Jurgen
>>>
>>>
>>>

>>>
>>>
>>> On 4/15/2011 11:03 PM, william sprowls wrote:
>>>
>>>>
>>>> Hi Jurgen,
>>>> Yes, 4.7 K is correct.
>>>> Scotty
>>>>
>>>> --- On Fri, 4/15/11, Jurgen <khj221@...> wrote:
>>>>
>>>> From: Jurgen <khj221@...>
>>>> Subject: Re: [spectrumanalyzer] PLO blues (and blacks)
>>>> To: spectrumanalyzer@yahoogroups.com
>>>> Date: Friday, April 15, 2011, 5:06 PM
>>>>
>>>>
>>>> Hello Scotty,
>>>>
>>>> Could you jog my memory please, what was the value of R23 on the PLO for the ADF4113.
>>>> I seem to remember 4.7k. Is that correct?
>>>>
>>>> Thanks, Jurgen
>>>>
>>>>
>>>>
>>>>
>>>> On 8/29/2010 12:00 AM, william sprowls wrote:
>>>>
>>>>>
>>>>> Hi Jim,
>>>>> Hopefully, Sam helped you fix your problem. I was going to advise to be sure to add R23 for the ADF4113. Same footprint as the LMX but it doesn't use R23.
>>>>> I think you are the first using the 4113. I will be interested to know the outcome of its total phase noise. It is supposed to exhibit a little less phase noise than the LMX. I'm guessing you might see a 1 or 2 dB improvement.
>>>>> Scotty
>>>>>
>>>>> --- On Sat, 8/28/10, jghbeta <jghalpha@...> wrote:
>>>>>
>>>>> From: jghbeta <jghalpha@...>
>>>>> Subject: [spectrumanalyzer] PLO blues (and blacks)
>>>>> To: spectrumanalyzer@yahoogroups.com
>>>>> Date: Saturday, August 28, 2010, 10:57 AM
>>>>>
>>>>>
>>>>> Has anyone been succesful with the ADF4113 or 4112 instead of the LMX?
>>>>> I built my PLO3 with the ADF4113, including the extra resistor, and on start up it climbs the control voltage to the VCO from 0 to 22.2 volts and STAYS THERE. The 10.7 square signal from the DDS is identical to the one in PLO1 and all voltages and currents appear to

be OK. Changing Modes does not change anything. I am truly stumped.
>>>>>
>>>>> Jim W1JGH
>>>>>
>>>>>
>>>
>>
>
>

7968. Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 14:13:19 UTC
From: Robert Fish
Topic: 7968 Message: 7968

Hi Guys,

I was surfing the web this morning and stumbled across the Far Circuits website while researching a different project. Far circuits has been around for a while.
I have purchased pre-made circuit boards from them in the past.

Here is the link: http://www.farcircuits.net/

On their site they offer to make boards from ExpressPCB files.

Here is the text from the pricing page:
/
FAR Circuits now will accept Express PCB files and make the required boards from your files. Just email mail@... your Express PCB files.

Pricing is as follows:
All boards are made of G-10, FR-4 material, 1 oz. copper, solder coated, and drilled.
Double sided boards DO NOT have plated through holes.
Custom boards may be made for $.50 square inch or $5.00 minimum per board for single sided, etched, drilled and solder coated. A film shot is required for the solder side and the legend at $10.00 per shot.
Custom double sided non-plated through holes, etched, drilled and solder coated boards may be made for $.75 per square inch or $8.00 minimum per board. A film shot is required for the solder side, component side, and the legend at $10.00 per shot.

Quantity pricing available. Far Circuits reserves the right to change the pricing based on the complexity of the board. FAR Circuits offers layout and prototype services. Please call or us if you have any questions./

I am not sure I understand all of that, or if it is any cheaper than express PCB themselves, but here is the info never the less. It might be a good way to have boards made.

Bob

7969. Re: Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 14:29:08 UTC
From: Sam
Topic: 7968 Message: 7969

Bob,
The lack of plated-through holes sounds like a killer to me, unless you enjoy soldering Z-wires. But maybe it would be good for special purpose boards that might be single-sided, or might have a small number of vias.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Robert Fish <rwfish@...> wrote:
>
> Hi Guys,
>
> I was surfing the web this morning and stumbled across the Far Circuits
> website while researching a different project. Far circuits has been
> around for a while.
> I have purchased pre-made circuit boards from them in the past.
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> Here is the link: http://www.farcircuits.net/
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> and drilled.
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> Custom boards may be made for $.50 square inch or $5.00 minimum per
> board for single sided, etched, drilled and solder coated. A film shot
> is required for the solder side and the legend at $10.00 per shot.
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> coated boards may be made for $.75 per square inch or $8.00 minimum per
> board. A film shot is required for the solder side, component side, and
> the legend at $10.00 per shot.
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> the pricing based on the complexity of the board. FAR Circuits offers
> layout and prototype services. Please call or us if you have any
> questions./
>
>
> I am not sure I understand all of that, or if it is any cheaper than
> express PCB themselves, but here is the info never the less. It might be

> a good way to have boards made.
>
>
>
> Bob
>

7970. Hits, some Misses

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 15:13:02 UTC
From: william
Topic: 7970 Message: 7970

Hi All,
I happened to notice that the "Hit" counter on the MSA web page just went over one-half million. I wanted to stop and thank each and every one of you for showing interest in the MSA Project. It warms my heart that this and many other "Do-It-Yourself" projects have gained popularity. The nay-sayers had given "DIY" projects the death knell. Bologna, they will continue because there is great satisfaction in building something useful with your God-given talents.
Scotty

7971. Re: [spectrumanalyzer] Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 15:15:26 UTC
From: William Dillon
Topic: 7968 Message: 7971

If you're willing to use a program other than expressPCB, there are TONS of great places for cheap boards, here are 2 examples:

iTead studio: Double-sided (plated through holes) 6-6 (min. trace/spacing in mils) with soldermask and silkscreen
Within 5x5cm square $12 for 10 boards
Within 10x10cm square $28 for 10 boards

Hey have lots more options, but those are the most generic
http://iteadstudio.com/store/index.php?main_page=index&cPath=19_20

Also, BatchPCB: Double-sided (plated through holes) 8-8 (min. trace/spacing in mils) with soldermask and silkscreen
$0.25 per Sq. inch $10 setup per order (can be many designs)

On Apr 21, 2011, at 7:13 AM, Robert Fish wrote:

> Hi Guys,
>
> I was surfing the web this morning and stumbled across the Far Circuits website while researching a different project. Far circuits has been around for a while.
> I have purchased pre-made circuit boards from them in the past.
>
> Here is the link: http://www.farcircuits.net/
>
> On their site they offer to make boards from ExpressPCB files.
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> Here is the text from the pricing page:
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> FAR Circuits now will accept Express PCB files and make the required boards from your files. Just email mail@... your Express PCB files.
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> Quantity pricing available. Far Circuits reserves the right to change the pricing based on the complexity of the board. FAR Circuits offers layout and prototype services. Please call or us if you have any questions.
>

>
> I am not sure I understand all of that, or if it is any cheaper than express PCB themselves, but here is the info never the less. It might be a good way to have boards made.
>
>
>
> Bob
>

7972. Re: [spectrumanalyzer] Hits, some Misses

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 16:27:02 UTC
From: Greg Broburg
Topic: 7970 Message: 7972

OUTSTANDING Scotty

The contributions of you and others is wonderful to see
and the evolution of this project is fascinating.

I remember what one of my professors presented to us long
ago and in a far away galaxy; "The quality of the observation
is not in the number of individual observations but in the
number of observers." Your website invites this breadth which
should be the envy of many engineering groups.

Best Regards;

Greg

On 4/21/2011 9:13 AM, william wrote:
>
> Hi All,
> I happened to notice that the "Hit" counter on the MSA web page just
> went over one-half million. I wanted to stop and thank each and every
> one of you for showing interest in the MSA Project. It warms my heart
> that this and many other "Do-It-Yourself" projects have gained
> popularity. The nay-sayers had given "DIY" projects the death knell.
> Bologna, they will continue because there is great satisfaction in
> building something useful with your God-given talents.
> Scotty
>
>

7973. Re: [spectrumanalyzer] Hits, some Misses

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 15:47:47 UTC
From: Robert Cerreto
Topic: 7970 Message: 7973

Scotty et al,

To be sure many of us who belong to this group feel the same as you. Also worth mentioning is the "sharing" of those skills, knowledge and joys. And the whole group started with Scotty. No amount of wealth could replace and/or buy this.

Thanks Scotty et al.

73, Bob WA!FXT

--- On Thu, 4/21/11, william <wsprowls@...> wrote:

From: william <wsprowls@...>
Subject: [spectrumanalyzer] Hits, some Misses
To: spectrumanalyzer@yahoogroups.com
Date: Thursday, April 21, 2011, 11:13 AM

Hi All,
I happened to notice that the "Hit" counter on the MSA web page just went over one-half million. I wanted to stop and thank each and every one of you for showing interest in the MSA Project. It warms my heart that this and many other "Do-It-Yourself" projects have gained popularity. The nay-sayers had given "DIY" projects the death knell. Bologna, they will continue because there is great satisfaction in building something useful with your God-given talents.
Scotty

7974. Re: [spectrumanalyzer] Hits, some Misses

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 17:06:57 UTC
From: w4zcb
Topic: 7970 Message: 7974

You Betcha Red Ryder! Homebrew Forever.

W4ZCB

(That first part has apparently been adopted as an Alaska term)

----- Original Message -----
From: "william" <wsprowls@...>
To: <spectrumanalyzer@yahoogroups.com>
Sent: Thursday, April 21, 2011 11:13 AM
Subject: [spectrumanalyzer] Hits, some Misses

Hi All,
I happened to notice that the "Hit" counter on the MSA web page just
went over one-half million. I wanted to stop and thank each and every
one of you for showing interest in the MSA Project. It warms my heart
that this and many other "Do-It-Yourself" projects have gained
popularity. The nay-sayers had given "DIY" projects the death knell.
Bologna, they will continue because there is great satisfaction in
building something useful with your God-given talents.
Scotty

7975. Log Det/VGA Ckt Values for Expanded Log Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 17:10:56 UTC
From: lh1907
Topic: 7975 Message: 7975

After reviewing the following info:

1. Expanded-Range Log Detector, updated 9/25/10 (Sam W's white paper);
2. Following schematics in ExpandedLog.sch file:
a. Log Detector, Rev 1.1, 3/15/10, and
b. VGA, Rev 1.1, 9/10/10; and
3.Log Detect PCB SEW Mod 3/15/10.

I could not reconcile the following aspects of Fdbk interface from Log Det to VGA.

A. The R/C values at Log Det MagVolts source is 220 ohm/0.01 uF (2b note) vs 2.7 kohms/0.001 uF (2a - R7/C13).

B Log Det R6 value is 75 ohms (3 note) vs 100 ohm (1) on page 5.

C. VGA R2 value is 3.0 kohms (2b) vs short (1) on page 8.

In the Expanded Log Amp configuration, since the MagVolts source for ADC is VGA rather than Log Det, can the J2 Log Det connector be used as the source for VGA Fdbk input rather than Log Det J2A?

Larry, W2HHV

7976. Re: Log Det/VGA Ckt Values for Expanded Log Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 17:45:21 UTC
From: Sam
Topic: 7975 Message: 7976

Larry,
The Expanded Log Detector has gone through some evolution, so there are various schematics floating around. Originally, it required modifying the Log Detector to split the detector output to two SMA connectors. Then I modified the VGA so the Log Detector could be used in its original form, with the detector output run to the VGA as feedback, and the VGA having an extra output to run that same signal to the ADC. The most current schematic is the one on my web site called "Even more updated Schematic and Layout", and can be downloaded here:

<http://www.wetterlin.org/sam/SA/ExpandedLogDetect/SimpleExpandedLog.zip>

The present arrangement adds the VGA and noise filter in front of the standard Log Detector. But it is also possible to change R6 on the Log Detector to 100 ohms to increase the RF output level. You also have a choice between a fixed noise filter or the switchable one. The latter should give a bit more low end range with narrow RBW filters. I have not actually built the switchable noise filter as currently designed. I built and am using an earlier, more cumbersome version, though it works well.

When using the Expanded Log Detector, the IF2 amp can be replaced with a 28 dB version that is also on my web site:

<http://www.wetterlin.org/sam/SA/ExpandedLogDetect/IF2Amp_OPA847.zip>

It will draw about 45 mA less current than the original IF Amp, and provides 12 dB less gain to avoid overloading RBW filters. But if you have the original IF Amp, you can use it, adding some output attenuation if you want to reduce the gain.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@...> wrote:
>
> After reviewing the following info:
>
> 1. Expanded-Range Log Detector, updated 9/25/10 (Sam W's white paper);
> 2. Following schematics in ExpandedLog.sch file:
> a. Log Detector, Rev 1.1, 3/15/10, and
> b. VGA, Rev 1.1, 9/10/10; and
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>
> I could not reconcile the following aspects of Fdbk interface from Log Det to VGA.
>
> A. The R/C values at Log Det MagVolts source is 220 ohm/0.01 uF (2b note) vs 2.7 kohms/0.001 uF (2a - R7/C13).
>
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> In the Expanded Log Amp configuration, since the MagVolts source for ADC is VGA rather than Log Det, can the J2 Log Det connector be used as the source for VGA Fdbk input rather than Log Det J2A?
>
> Larry, W2HHV
>

7977. Re: Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 17:58:19 UTC
From: inlinebeginner
Topic: 7968 Message: 7977

The free ExpressPCB software does not a function to create gerber and drill files. That is why we could not make the board from other PCB factory, which may be much cheaper than expressPCB.
Lin

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> If you're willing to use a program other than expressPCB, there are TONS of great places for cheap boards, here are 2 examples:
>
> iTead studio: Double-sided (plated through holes) 6-6 (min. trace/spacing in mils) with soldermask and silkscreen
> Within 5x5cm square $12 for 10 boards
> Within 10x10cm square $28 for 10 boards
>
> Hey have lots more options, but those are the most generic
> http://iteadstudio.com/store/index.php?main_page=index&cPath=19_20
>
> Also, BatchPCB: Double-sided (plated through holes) 8-8 (min. trace/spacing in mils) with soldermask and silkscreen
> $0.25 per Sq. inch $10 setup per order (can be many designs)
>
> On Apr 21, 2011, at 7:13 AM, Robert Fish wrote:
>
> > Hi Guys,
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> > I was surfing the web this morning and stumbled across the Far Circuits website while researching a different project. Far circuits has been around for a while.
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> > Here is the text from the pricing page:
> >
> > FAR Circuits now will accept Express PCB files and make the required boards from your files. Just email mail@... your Express PCB files.
> >
> > Pricing is as follows:
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> > Double sided boards DO NOT have plated through holes.
> > Custom boards may be made for $.50 square inch or $5.00 minimum per board for single sided, etched, drilled and solder coated. A film shot is required for the solder side and the legend at $10.00 per shot.

> > Custom double sided non-plated through holes, etched, drilled and solder coated boards may be made for $.75 per square inch or $8.00 minimum per board. A film shot is required for the solder side, component side, and the legend at $10.00 per shot.
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> > Quantity pricing available. Far Circuits reserves the right to change the pricing based on the complexity of the board. FAR Circuits offers layout and prototype services. Please call or us if you have any questions.
> >
> >
> > I am not sure I understand all of that, or if it is any cheaper than express PCB themselves, but here is the info never the less. It might be a good way to have boards made.
> >
> >
> >
> > Bob
> >
>

7978. Re: [spectrumanalyzer] Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 18:11:07 UTC
From: William Dillon
Topic: 7968 Message: 7978

Yep, I know.

I'm willing to spend time transferring some of the stable PCBs (such as the MOB, PLL, etc) to eagle, or some other PCB cad program so we can get much cheaper boards. I offered this before, but people seemed resistant to the idea. I know that Sam and Scotty like to use express PCB, so for the in-flux designs it doesn't make sense.

- Will

On Apr 21, 2011, at 10:58 AM, inlinebeginner wrote:

> The free ExpressPCB software does not a function to create gerber and drill files. That is why we could not make the board from other PCB factory, which may be much cheaper than expressPCB.
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
> >
> > If you're willing to use a program other than expressPCB, there are TONS of great places for cheap boards, here are 2 examples:
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> > Also, BatchPCB: Double-sided (plated through holes) 8-8 (min. trace/spacing in mils) with soldermask and silkscreen
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> > On Apr 21, 2011, at 7:13 AM, Robert Fish wrote:
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> > >
> > > I am not sure I understand all of that, or if it is any cheaper than express PCB themselves, but here is the info never the less. It might be a good way to have boards made.
> > >
> > >
> > >
> > > Bob
> > >
> >
>
>

7979. Re: Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 18:28:17 UTC
From: ed_k7ock
Topic: 7968 Message: 7979

Speaking of boards, is there a pcb file for the RBW board that combines the 4 filters and switch onto one board? I would sure link to get away from using all those SMA connectors and jumper.

Thx

Ed G

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> Yep, I know.
>
> I'm willing to spend time transferring some of the stable PCBs (such as the MOB, PLL, etc) to eagle, or some other PCB cad program so we can get much cheaper boards. I offered this before, but people seemed resistant to the idea. I know that Sam and Scotty like to use express PCB, so for the in-flux designs it doesn't make sense.
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> - Will
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> On Apr 21, 2011, at 10:58 AM, inlinebeginner wrote:
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> > > >
> > > > I am not sure I understand all of that, or if it is any cheaper than express PCB themselves, but here is the info never the less. It might be a good way to have boards made.
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> > > >
> > > >
> > > > Bob
> > > >
> > >
> >
> >
>

7980. Re: Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 18:58:20 UTC
From: Sam
Topic: 7968 Message: 7980

See RBW_Filter_Board.pcb in the Files section. This combines the RBW filter switch, two ceramic filters, a 5-crystal filter (Scotty's schematic) or 3-MCF filter (per Lin's postings). Three direct-soldered coax jumpers are necessary on the board, but all other connections are done with traces.

Jim Hontoria made up a couple of these boards, with some modifications. He may still have an extra.

There is no unified schematic for this board, but each section uses the same numbering as its original schematic. There are a few changes in the filter switch relating to elimination of the connectors, and a few SMT jumpers are needed to complete the connections to some filters, but all that should be clear from the board. The amplifilter is modified from the original, but the schematic for the amplifilter in the Files section contains both the original and modified schematics. The modifications simply delete the regulator, since it taps into the +5V supply of the RBW switch. I noticed on Jim's version of this board, he preserved the +8V regulator for the amplifilter.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "ed_k7ock" <ed_k7ock@...> wrote:
>
> Speaking of boards, is there a pcb file for the RBW board that combines the 4 filters and switch onto one board? I would sure link to get away from using all those SMA connectors and jumper.
>
> Thx
>
> Ed G
>
> --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@> wrote:
> >
> > Yep, I know.
> >
> > I'm willing to spend time transferring some of the stable PCBs (such as the MOB, PLL, etc) to eagle, or some other PCB cad program so we can get much cheaper boards. I offered this before, but people seemed resistant to the idea. I know that Sam and Scotty like to use express PCB, so for the in-flux designs it doesn't make sense.
> >
> > - Will
> >
> > On Apr 21, 2011, at 10:58 AM, inlinebeginner wrote:
> >
> > > The free ExpressPCB software does not a function to create gerber and drill files. That is why we could not make the board from other PCB factory, which may be much cheaper than expressPCB.
> > > Lin

> > >
> > > --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@> wrote:
> > > >
> > > > If you're willing to use a program other than expressPCB, there are TONS of great places for cheap boards, here are 2 examples:
> > > >
> > > > iTead studio: Double-sided (plated through holes) 6-6 (min. trace/spacing in mils) with soldermask and silkscreen
> > > > Within 5x5cm square $12 for 10 boards
> > > > Within 10x10cm square $28 for 10 boards
> > > >
> > > > Hey have lots more options, but those are the most generic
> > > > http://iteadstudio.com/store/index.php?main_page=index&cPath=19_20
> > > >
> > > > Also, BatchPCB: Double-sided (plated through holes) 8-8 (min. trace/spacing in mils) with soldermask and silkscreen
> > > > $0.25 per Sq. inch $10 setup per order (can be many designs)
> > > >
> > > > On Apr 21, 2011, at 7:13 AM, Robert Fish wrote:
> > > >
> > > > > Hi Guys,
> > > > >
> > > > > I was surfing the web this morning and stumbled across the Far Circuits website while researching a different project. Far circuits has been around for a while.
> > > > > I have purchased pre-made circuit boards from them in the past.
> > > > >
> > > > > Here is the link: http://www.farcircuits.net/
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> > > > > On their site they offer to make boards from ExpressPCB files.
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> > > > > Here is the text from the pricing page:
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> > > > > I am not sure I understand all of that, or if it is any cheaper than express PCB themselves, but here is the info never the less. It might be a good way to have boards made.
> > > > >
> > > > >
> > > > >
> > > > > Bob
> > > > >
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7981. Re: Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 19:15:01 UTC
From: Sam
Topic: 7968 Message: 7981

Will,
I like ExpressPCB because it is simple and fast, but I'm certainly not opposed to converting the boards to a standard CAD format, especially, as you say, for boards whose design is well settled. Eagle would be a good choice, because a lot of manufacturers use their format in addition to Gerbers. I checked out iTead, which you mentioned, and noted that they have a very simple way to use Eagle files. I have Eagle installed on my computer, though I don't want to redo the layouts myself.

A lot of manufacturers, which I believe includes iTead, don't allow combining two boards onto one PCB. They seem to think you are taking advantage of them, though I don't see how it is any of their business what you put on your board. That can reduce the apparent price advantage of these outfits. On the other hand, it would be nice to obtain individual boards to avoid the need to cut a large board into pieces.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> Yep, I know.
>
> I'm willing to spend time transferring some of the stable PCBs (such as the MOB, PLL, etc) to eagle, or some other PCB cad program so we can get much cheaper boards. I offered this before, but people seemed resistant to the idea. I know that Sam and Scotty like to use express PCB, so for the in-flux designs it doesn't make sense.
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> > > > I am not sure I understand all of that, or if it is any cheaper than express PCB themselves, but here is the info never the less. It might be a good way to have boards made.
> > > >
> > > >
> > > >
> > > > Bob
> > > >
> > >
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7982. Re: [spectrumanalyzer] Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 21:19:10 UTC
From: Jim Hontoria
Topic: 7968 Message: 7982

Plated through holes are absolutely necessary. Can't live without.

Jim

On Thu, Apr 21, 2011 at 10:13 AM, Robert Fish <rwfish@...> wrote:

>
>
> Hi Guys,
>
> I was surfing the web this morning and stumbled across the Far Circuits
> website while researching a different project. Far circuits has been around
> for a while.
> I have purchased pre-made circuit boards from them in the past.
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> prototype services. Please call or us if you have any questions.*
>
>
> I am not sure I understand all of that, or if it is any cheaper than
> express PCB themselves, but here is the info never the less. It might be a
> good way to have boards made.
>
>

>
> Bob
>
>

--
Jim G. Hontoria

7983. Re: [spectrumanalyzer] Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 22:37:01 UTC
From: Greg Broburg
Topic: 7968 Message: 7983

Yeah Jim;

I second that emotion, my vote is must have too.

Greg

On 4/21/2011 3:19 PM, Jim Hontoria wrote:
> Plated through holes are absolutely necessary. Can't live without.
> Jim
>
> On Thu, Apr 21, 2011 at 10:13 AM, Robert Fish <rwfish@...
> <mailto:rwfish@...>> wrote:
>
> Hi Guys,
>
> I was surfing the web this morning and stumbled across the Far
> Circuits website while researching a different project. Far
> circuits has been around for a while.
> I have purchased pre-made circuit boards from them in the past.
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>
> I am not sure I understand all of that, or if it is any cheaper
> than express PCB themselves, but here is the info never the less.
> It might be a good way to have boards made.
>
>
>
> Bob
>
>
>
>
> --
> Jim G. Hontoria
>

7984. Re: [spectrumanalyzer] Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-21 22:34:32 UTC
From: Jim Hontoria
Topic: 7968 Message: 7984

Unless you are ONLY using thru hole components. Remember them?

Jim

On Thu, Apr 21, 2011 at 6:37 PM, Greg Broburg <semiflex@...> wrote:

>
>
> Yeah Jim;
>
> I second that emotion, my vote is must have too.
>
> Greg
>
>
>
> On 4/21/2011 3:19 PM, Jim Hontoria wrote:
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>
> Plated through holes are absolutely necessary. Can't live without.
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> On Thu, Apr 21, 2011 at 10:13 AM, Robert Fish <rwfish@...> wrote:
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>>
>>
>>
>> Bob
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> --
> Jim G. Hontoria
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>

--
Jim G. Hontoria

7985. RE: [spectrumanalyzer] Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 01:45:44 UTC
From: dave@wb6dhw.com
Topic: 7968 Message: 7985

? I use KICAD for my designs.? It is FREE, open source, and works on Windows, Linux, and OSX.? It will output standard Gerber files which any manufacturer.? I think whatever CAD system you use should be available free so others can modify for their own use.
I do not order from Far Circuits because of the lack of plated thru holes.

Dave - WB6DHW
<http://wb6dhw.com>;

-------- Original Message --------
Subject: Re: [spectrumanalyzer] Circuit Board Source
From: William Dillon <hpux735@...>
Date: Thu, April 21, 2011 11:11 am
To: spectrumanalyzer@yahoogroups.com

?

Yep, I know.

I'm willing to spend time transferring some of the stable PCBs (such as the MOB, PLL, etc) to eagle, or some other PCB cad program so we can get much cheaper boards. ?I offered this before, but people seemed resistant to the idea. ?;I know that Sam and Scotty like to use express PCB, so for the in-flux designs it doesn't make sense.

- Will

On Apr 21, 2011, at 10:58 AM, inlinebeginner wrote:

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> >
> >
> > Bob
> >
>

7986. Re: [spectrumanalyzer] Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 02:04:21 UTC
From: William Dillon
Topic: 7968 Message: 7986

I totally agree... but...

I use eagle almost every day. It's not open source, but it's still free to use for hobbies. I can't justify the expense of learning a new CAD program, and recreating all of my libraries. To be honest, I've got a license of Altium Designer, which is one of the nicest electronic design programs there is... but I don't really use it due to the learning curve. If you'd like to take the charge on transferring the designs using KICAD, I think that would be great!

- Will

On Apr 21, 2011, at 6:45 PM, <dave@...> <dave@...> wrote:

>
> I use KICAD for my designs. It is FREE, open source, and works on Windows, Linux, and OSX. It will output standard Gerber files which any manufacturer. I think whatever CAD system you use should be available free so others can modify for their own use.
> I do not order from Far Circuits because of the lack of plated thru holes.
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> Dave - WB6DHW
> <http://wb6dhw.com>;
> -------- Original Message --------
> Subject: Re: [spectrumanalyzer] Circuit Board Source
> From: William Dillon <hpux735@...>
> Date: Thu, April 21, 2011 11:11 am
> To: spectrumanalyzer@yahoogroups.com
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>> > > Bob
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7987. Re: Call for Help

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 11:45:16 UTC
From: jghbeta
Topic: 7949 Message: 7987

Hi Scotty,
Is the 2N7002E a drop in replacement? How about the internal resistors in the MUN2211?

Jim, W1JGH

--- In spectrumanalyzer@yahoogroups.com, "william" <wsprowls@...> wrote:
>
> Hi All,
> I have determined that the MUN2211 buffer transistor, used in the AtoD Converter Module, needs to be replaced with a different device. Although it works as intended, it's speed is a bottle neck for the new USB control.
> The best possible replacement is an open drain FET that has a gate turn-on characteristic of standard CMOS logic.
> There are literally hundreds of these devices on the market and I don't have the time or testing capability to do the proper research. So, I am asking for a little help. Those of you who have a good "junk-box", find one and test it in your AtoD module. Here are the requirements:
> * Size: SOT-23, SOT-23-3, TO-236, case 318-80. This is the pad size on the pwb of the AtoD.
> * N-channel
> * Enhancement mode
> * Gate threshold: 1.0v to 3.0v, 2.5 volt preferred.
> * Open Drain
> * Pin-outs: Drain, top single pin; Gate, lower left pin; Source, lower right pin
> * Maximum continuous current: at least 5 ma.
> * Maximum drain voltage: at least 10 volts
> * Turn-on and turn-off delay: 500 nsec or faster.
> * Internal diode protection
> * Available at Digikey in single quantities (cheap)
>
> Here are a couple of devices that meet the reqmts. You can use their data sheets as examples in your search.
> http://www.onsemi.com/pub_link/Collateral/2N7002E-D.PDF
> http://www.diodes.com/datasheets/ZVN3310F.pdf
>
> If you think you have a good device but cannot test it yourself, post to the group and arrange to send it to someone who can test it.
>
> Scotty
>

7988. Re: Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 11:57:30 UTC
From: Sam
Topic: 7968 Message: 7988

Eagle will also produce gerbers, but many manufacturers take the Eagle files directly. I used to use Eagle a lot, and loved it. I tried KICAD, and never really took to it. But I'd say that if anyone wants to convert the layouts, they can use any program they want!

I also recall someone saying that once you order boards from ExpressPCB, you can get the gerbers from them. I don't know whether that is true, but it would be worth checking.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> I totally agree... but...
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> > <http://wb6dhw.com>;
> > -------- Original Message --------
> > Subject: Re: [spectrumanalyzer] Circuit Board Source
> > From: William Dillon <hpux735@...>
> > Date: Thu, April 21, 2011 11:11 am
> > To: spectrumanalyzer@yahoogroups.com
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> >> > >
> >> > >
> >> > > Bob
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> >> >
> >>
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> >
>

7989. Re: Call for Help

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 12:05:38 UTC
From: Sam
Topic: 7949 Message: 7989

Jim,
In theory that should work, but in theory the MUN2211 should have worked better than it does. I think what Scotty was looking for is someone to actually try out the FET. Those resistors are for limiting the current load on the ADC and setting the on/off threshold, and shouldn't be needed for the FET.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> Hi Scotty,
> Is the 2N7002E a drop in replacement? How about the internal resistors in the MUN2211?
>
> Jim, W1JGH
>
> --- In spectrumanalyzer@yahoogroups.com, "william" <wsprowls@> wrote:
> >
> > Hi All,
> > I have determined that the MUN2211 buffer transistor, used in the AtoD Converter Module, needs to be replaced with a different device. Although it works as intended, it's speed is a bottle neck for the new USB control.
> > The best possible replacement is an open drain FET that has a gate turn-on characteristic of standard CMOS logic.
> > There are literally hundreds of these devices on the market and I don't have the time or testing capability to do the proper research. So, I am asking for a little help. Those of you who have a good "junk-box", find one and test it in your AtoD module. Here are the requirements:
> > * Size: SOT-23, SOT-23-3, TO-236, case 318-80. This is the pad size on the pwb of the AtoD.
> > * N-channel
> > * Enhancement mode
> > * Gate threshold: 1.0v to 3.0v, 2.5 volt preferred.
> > * Open Drain
> > * Pin-outs: Drain, top single pin; Gate, lower left pin; Source, lower right pin
> > * Maximum continuous current: at least 5 ma.
> > * Maximum drain voltage: at least 10 volts
> > * Turn-on and turn-off delay: 500 nsec or faster.
> > * Internal diode protection
> > * Available at Digikey in single quantities (cheap)
> >
> > Here are a couple of devices that meet the reqmts. You can use their data sheets as examples in your search.
> > http://www.onsemi.com/pub_link/Collateral/2N7002E-D.PDF
> > http://www.diodes.com/datasheets/ZVN3310F.pdf
> >
> > If you think you have a good device but cannot test it yourself, post to the group and

arrange to send it to someone who can test it.
> >
> > Scotty
> >
>

7990. Re: [spectrumanalyzer] Re: Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 12:08:51 UTC
From: w4zcb
Topic: 7968 Message: 7990

Yes, I bought the Gerbers from Express years ago for the original N2PK VNA boards. Giancarlo then had boards made in EU for pennies on the dollar. At that time after Express had made the originals, you could purchase the Gerbers from them for $75.

W4ZCB

Eagle will also produce gerbers, but many manufacturers take the Eagle files directly. I used to use Eagle a lot, and loved it. I tried KICAD, and never really took to it. But I'd say that if anyone wants to convert the layouts, they can use any program they want!

I also recall someone saying that once you order boards from ExpressPCB, you can get the gerbers from them. I don't know whether that is true, but it would be worth checking.

Sam W.

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>

7991. Re: Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 12:40:43 UTC
From: Sam
Topic: 7968 Message: 7991

If we had gerber files, could they be imported and modified in Eagle, KICAD or some other program? I'm guessing you could make simple modifications with some sort of graphics editor, but wouldn't be able to recreate the board as a collection of traces and pads that could be individually moved, deleted, etc.
Sam W.

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> > > From: William Dillon <hpux735@>
> > > Date: Thu, April 21, 2011 11:11 am
> > > To: spectrumanalyzer@yahoogroups.com
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7992. Re: [spectrumanalyzer] Re: Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 13:46:57 UTC
From: Robert Fish
Topic: 7968 Message: 7992

Hi Guys,

I have placed a couple of fairly large (by my standards) orders with PCBexpress. Let me see if they will provide me with the gerbers. It would be for the full panel and for the filter switch board as those are the only orders I have placed with them.
If I can get my hands on them, I will upload them to the files section of the group website if you guys think that is where they belong.

Bob

>
> I also recall someone saying that once you order boards from
> ExpressPCB, you can get the gerbers from them. I don't know whether
> that is true, but it would be worth checking.
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> Sam W.
>
>
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>
> Switch to: Text-Only
> <mailto:spectrumanalyzer-traditional@yahoogroups.com?subject=Change%20Delivery%20Format:
%20Traditional>,
> Daily Digest
> <mailto:spectrumanalyzer-digest@yahoogroups.com?subject=Email%20Delivery:%20Digest>
> . Unsubscribe
> <mailto:spectrumanalyzer-unsubscribe@yahoogroups.com?subject=Unsubscribe>
> . Terms of Use <http://docs.yahoo.com/info/terms/>
> .
>
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7993. Re: [spectrumanalyzer] Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 14:14:26 UTC
From: William Dillon
Topic: 7968 Message: 7993

Sam,

Yes and no.

You can make some simple changes, like adding a bit of copper here and theres, but anything large would be next to impossible. The gerber format is truly bizarre. It also doesn't contain any net list information. It is nothing more than "apertures," which are basic shapes like a square or circle, and paths which are commands like: open the shutter, move to this x,y, close the shutter, etc.

I've spent about 20 minutes on the MOB while watching TV and it's getting close to being done. I have one question about the coax connections though. It has a quality that I'm not sure how to reproduce. On the construction page http://www.scottyspectrumanalyzer.com/construction.html it looks like the signal pad has different annulus diameters on one side of the board than the other. Is this true, or is it just a fluke?

Thanks,
- Will

On Apr 22, 2011, at 5:40 AM, Sam wrote:

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7994. Re: Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 14:44:39 UTC
From: Sam
Topic: 7968 Message: 7994

Sounds a lot like "turtle graphics". If you have the gerber file for a PCB made up of many smaller boards, is it feasible to create several gerber files, each containing just a single board? Sounds like that would be difficult.

Ideally, the coax holes would have no annulus on the bottom. It's probably necessary to make the bottom match the top, as it is in ExpressPCB, which is OK because the bottom pad is easily removed by hand with a couple of twists with a drill bit.
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> Yes and no.
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> You can make some simple changes, like adding a bit of copper here and theres, but anything large would be next to impossible. The gerber format is truly bizarre. It also doesn't contain any net list information. It is nothing more than "apertures," which are basic shapes like a square or circle, and paths which are commands like: open the shutter, move to this x,y, close the shutter, etc.
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7995. Re: Circuit Board Source, Holophase OmniGlyph

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 16:16:29 UTC
From: Greg Broburg
Topic: 7968 Message: 7995

Hello group;

I have watched this discussion about PCB layout tool issues for several years. I have been a user of Holophase Circad/OmniGlyph for many years. In addition I have supported many new users who have wanted to learn this program. I understand that ExpressPCB is now a defacto standard for our group. These files can be, perhaps already have been converted to Circad format.

The demonstration version of OmniGlyph is available free on the www.holophase.com website and is mostly complete in that it allows an unlimited PCB/schematic/drawing file capture. These files are generally open to saving and sharing among the users and are not tied to any PCB production company. The issue of post production to Gerber generation is the issue which requires a little bit of money in one way shape or form to make up for the idea of using the demo program concept as a starting point. I have talked to Fred Lehman owner of Holophase about an idea to make the demo program a foundation for people who want to corroborate on this idea.

Any thoughts?

Regards;

Greg

On 4/22/2011 8:14 AM, William Dillon wrote:
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> Sam,
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> Yes and no.
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7996. Re: [spectrumanalyzer] Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 15:46:14 UTC
From: William Dillon
Topic: 7968 Message: 7996

Sam,

Yep, you've got the right idea. It is possible to make many boards from a larger one. The issue is mostly that of deciding what the origin is. It's also possible to make a larger panel from many designs.

I'll look into making the coax connections in some different ways, then I'll bring it up to the list for opinions...

- Will

On Apr 22, 2011, at 7:44 AM, Sam wrote:

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> > > > > > Dave - WB6DHW
> > > > > > <http://wb6dhw.com>;
> > > > > > -------- Original Message --------
> > > > > > Subject: Re: [spectrumanalyzer] Circuit Board Source
> > > > > > From: William Dillon <hpux735@>
> > > > > > Date: Thu, April 21, 2011 11:11 am
> > > > > > To: spectrumanalyzer@yahoogroups.com
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7997. Re: [spectrumanalyzer] Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 16:03:48 UTC
From: william sprowls
Topic: 7968 Message: 7997

Hi William,
  That is not a fluke. We would like the smallest pad size on the ground plane side (bottom) and a larger size on the circuit side (top). This is so that the smaller pad can be easily removed with a hand held drill bit when using the "direct connection" method of attaching coaxial cables.
Scotty

--- On Fri, 4/22/11, William Dillon <hpux735@...> wrote:

From: William Dillon <hpux735@...>
Subject: Re: [spectrumanalyzer] Circuit Board Source
To: spectrumanalyzer@yahoogroups.com
Date: Friday, April 22, 2011, 9:14 AM

Sam,
Yes and no.
You can make some simple changes, like adding a bit of copper here and theres, but anything large would be next to impossible. The gerber format is truly bizarre. It also doesn't contain any net list information. It is nothing more than "apertures," which are basic shapes like a square or circle, and paths which are commands like: open the shutter, move to this x,y, close the shutter, etc.
I've spent about 20 minutes on the MOB while watching TV and it's getting close to being done. I have one question about the coax connections though. It has a quality that I'm not sure how to reproduce. On the construction page http://www.scottyspectrumanalyzer.com/construction.html it looks like the signal pad has different annulus diameters on one side of the board than the other. Is this true, or is it just a fluke?
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If we had gerber files, could they be imported and modified in Eagle, KICAD or some other program? I'm guessing you could make simple modifications with some sort of graphics editor, but wouldn't be able to recreate the board as a collection of traces and pads that could be individually moved, deleted, etc.

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7998. Re: [spectrumanalyzer] Re: Circuit Board Source, Holophase OmniGlyph

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 16:34:38 UTC
From: william sprowls
Topic: 7968 Message: 7998

Hi Greg,
 The group has not really set the "defacto standard" for Express. Actually, it was me who has released all of the MSA designs in Express. The reason for that is that it is soooooo easy to use. I have tried Eagle, Circad, and a couple of others. They were not as "user friendly" as Express. Circad just sucks. It is DOS based trying to work in Windows.
 There is certainly no reason someone cannot "redo" the boards in another CAD program. The only thing is, there is the potential for "slip-ups" during the change-over process. This has occurred and I was not able to prevent it. Even though Express is much more expensive than everyone else, it is a very convenient program, allowing "cuts and pastes" of different boards to create a larger panel. I will continue to use Express, and any future modifications will be in Express. A change now would require an extensive update to many existing web pages.
Scotty

--- On Fri, 4/22/11, Greg Broburg <semiflex@...> wrote:

From: Greg Broburg <semiflex@...>
Subject: [spectrumanalyzer] Re: Circuit Board Source, Holophase OmniGlyph
To: spectrumanalyzer@yahoogroups.com, "Fred Lehman" <flehman@...>
Date: Friday, April 22, 2011, 11:16 AM

Hello group;

I have watched this discussion about PCB layout tool issues for

several years. I have been a user of Holophase Circad/OmniGlyph

for many years. In addition I have supported many new users who

have wanted to learn this program. I understand that ExpressPCB

is now a defacto standard for our group. These files can be,

perhaps already have been converted to Circad format.

The demonstration version of OmniGlyph is available free on

the www.holophase.com website and is mostly complete in that

it allows an unlimited PCB/schematic/drawing file capture. These

files are generally open to saving and sharing among the users

and are not tied to any PCB production company. The issue of

post production to Gerber generation is the issue which requires

a little bit of money in one way shape or form to make up for the

idea of using the demo program concept as a starting point. I

have talked to Fred Lehman owner of Holophase about an idea

to make the demo program a foundation for people who want to

corroborate on this idea.

Any thoughts?

Regards;

Greg

On 4/22/2011 8:14 AM, William Dillon wrote:

Sam,

Yes and no.

You can make some simple changes, like adding a bit of
copper here and theres, but anything large would be next
to impossible. The gerber format is truly bizarre. It
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7999. Re: Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 18:20:08 UTC
From: Sam
Topic: 7968 Message: 7999

I think it could be useful to have the boards available in another format, but it wouldn't be necessary to supplant the "official" ExpressPCB boards. For example, if just the MO, PLO, DDS and mixer boards were available in a gerber-friendly format, it might be feasible for someone to order a bunch at low cost and stockpile them. Or it might make it easier for non-USA builders to acquire the boards at a reasonable cost. And it would certainly make it easier to obtain individual boards, without the need to cut apart a large panel.

ExpressPCB's biggest weakness is the way it handles solder mask and silkscreen. While you can cut and paste to assemble small boards into a big one, the solder mask layer doesn't get copied or moved unless you do a separate operation on it, making it easy for the mask layer to become out-of-register. And the smallest available font for silkscreen is too big to make silkscreen useful on densely-packed boards, which are exactly the boards that can benefit from it. Personally, I am happy without silkscreen, but a lot of people seem to like it. The PLO boards in particular would probably be much easier to assemble if they had silkscreen labels.

So I wouldn't favor switching away from ExpressPCB, but I think it would make sense to supplement ExpressPCB for at least some of the boards.

(BTW, I mentioned I had tried KICAD, but now that I think about it, what I tried was Circad. It seemed awkward to use, but maybe I didn't get far enough along in the learning curve.)

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
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> Â The group has not really set the "defacto standard" for Express. Actually, it was me who has released all of the MSA designs in Express. The reason for that is that it is soooooo easy to use. I have tried Eagle, Circad, and a couple of others. They were not as "user friendly" as Express. Circad just sucks. It is DOS based trying to work in Windows.
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> Scotty
>
> --- On Fri, 4/22/11, Greg Broburg <semiflex@...> wrote:
>
> From: Greg Broburg <semiflex@...>
> Subject: [spectrumanalyzer] Re: Circuit Board Source, Holophase OmniGlyph
> To: spectrumanalyzer@yahoogroups.com, "Fred Lehman" <flehman@...>

> Date: Friday, April 22, 2011, 11:16 AM
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> Any thoughts?
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> copper here and theres, but anything large would be next
> to impossible. Â The gerber format is truly bizarre. Â It
> also doesn't contain any net list information. Â It is
> nothing more than "apertures," which are basic shapes like

> a square or circle, and paths which are commands like:
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> --- In spectrumanalyzer@yahoogroups.com,
> "w4zcb" <w4zcb@> wrote:
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> > to convert the layouts, they can use any
> program they want!
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> > I also recall someone saying that once you
> order boards from
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> > ExpressPCB, you can get the gerbers from
> them. I don't know whether
>
> > that is true, but it would be worth
> checking.
>
> >
>
> > Sam W.
>
> >
>
> > --- In spectrumanalyzer@yahoogroups.com,
> William Dillon <hpux735@>
>
> > wrote:
>
> > >
>
> > > I totally agree... but...

>
> > >
>
> > > I use eagle almost every day. It's not
> open source, but it's still
>
> > > free to use for hobbies. I can't
> justify the expense of learning a
>
> > > new CAD program, and recreating all of
> my libraries. To be honest,
>
> > > I've got a license of Altium Designer,
> which is one of the nicest
>
> > > electronic design programs there is...
> but I don't really use it
>
> > > due to the learning curve.
>
> > > If you'd like to take the charge on
> transferring the designs using
>
> > > KICAD, I think that would be great!
>
> > >
>
> > > - Will
>
> > >
>
> > > On Apr 21, 2011, at 6:45 PM,
> <dave@> <dave@> wrote:
>
> > >
>
> > > >
>
> > > > I use KICAD for my designs. It is
> FREE, open source, and works
>
> > > > on Windows, Linux, and OSX. It
> will output standard Gerber files
>
> > > > which any manufacturer. I think
> whatever CAD system you use
>
> > > > should be available free so
> others can modify for their own use.
>

> > > > I do not order from Far Circuits
> because of the lack of plated
>
> > > > thru holes.
>
> > > >
>
> > > > Dave - WB6DHW
>
> > > > <http://wb6dhw.com>;
>
> > > > -------- Original Message
> --------
>
> > > > Subject: Re: [spectrumanalyzer]
> Circuit Board Source
>
> > > > From: William Dillon
> <hpux735@>
>
> > > > Date: Thu, April 21, 2011 11:11
> am
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> > > > To: spectrumanalyzer@yahoogroups.com
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> > > > Scotty like to use express PCB,
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> > > > - Will
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> > > > On Apr 21, 2011, at 10:58 AM,
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> > > >> > iTead studio:
> Double-sided (plated through holes) 6-6 (min.
>
> > > >> > trace/spacing in mils)
> with soldermask and silkscreen
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> > > >> > Within 5x5cm square $12
> for 10 boards
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> > > >> > Within 10x10cm square
> $28 for 10 boards
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> > > >> > Hey have lots more
> options, but those are the most generic
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> > > >> > http://iteadstudio.com/store/index.php?main_page=index&cPath=19_20
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>
> > > >> > Also, BatchPCB:
> Double-sided (plated through holes) 8-8 (min.
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> > > >> > > Here is the link: http://www.farcircuits.net/
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> > > >> > > On their site they
> offer to make boards from ExpressPCB
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> > > >> > > files.
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> > > >> > > Here is the text
> from the pricing page:
>
> > > >> > >
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> from your files. Just email mail@ your
>
> > > >> > > Express PCB files.
>
> > > >> > >
>
> > > >> > > Pricing is as
> follows:
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> > > >> > > All boards are made
> of G-10, FR-4 material, 1 oz. copper,
>
> > > >> > > solder coated, and
> drilled.
>
> > > >> > > Double sided boards
> DO NOT have plated through holes.
>
> > > >> > > Custom boards may
> be made for $.50 square inch or $5.00
>
> > > >> > > minimum per board
> for single sided, etched, drilled and
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> > > >> > > solder coated. A
> film shot is required for the solder side
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> > > >> > > and the legend at
> $10.00 per shot.
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> non-plated through holes, etched, drilled

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8000. Re: [spectrumanalyzer] Re: Circuit Board Source, Holophase OmniGlyph

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 19:47:34 UTC
From: Greg Broburg
Topic: 7968 Message: 8000

Hello Scotty;

I am sorry that you feel that way about Circad.
OmniGlyph is a new program that was built from
scratch to run in the Windows environment. As
a user coming from Cadstar OrCad and AutoCad
I would have to say that Circad was excellent. I have
done now more than one hundred designs in Circad
/ Omniglyph and capture many designs into the
schematic features for electronic archiving.

I cannot imagine using ExpressPCB as a serious
CAD package but I understand why it is used.

Greg

On 4/22/2011 10:34 AM, william sprowls wrote:
>
> Hi Greg,
> The group has not really set the "defacto standard" for Express.
> Actually, it was me who has released all of the MSA designs in
> Express. The reason for that is that it is soooooo easy to use. I have
> tried Eagle, Circad, and a couple of others. They were not as "user
> friendly" as Express. Circad just sucks. It is DOS based trying to
> work in Windows.
> There is certainly no reason someone cannot "redo" the boards in
> another CAD program. The only thing is, there is the potential for
> "slip-ups" during the change-over process. This has occurred and I was
> not able to prevent it. Even though Express is much more expensive
> than everyone else, it is a very convenient program, allowing "cuts
> and pastes" of different boards to create a larger panel. I will
> continue to use Express, and any future modifications will be in
> Express. A change now would require an extensive update to many
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> files are generally open to saving and sharing among the users
> and are not tied to any PCB production company. The issue of
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> corroborate on this idea.
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> Any thoughts?
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> Regards;
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> Greg
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8001. Re: Circuit Board Source

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-22 23:59:00 UTC
From: inlinebeginner
Topic: 7968 Message: 8001

Ed
I just made such a combined RBW board for several pieces, with latest MSA collections. Yes, the purpose is to get rid of the SMAs.
I put a photo here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/179096224/view?picmode=&mode=tn&order=ordinal&start=41&count=20&dir=asc

Lin
--- In spectrumanalyzer@yahoogroups.com, "ed_k7ock" <ed_k7ock@...> wrote:
>
> Speaking of boards, is there a pcb file for the RBW board that combines the 4 filters and switch onto one board? I would sure link to get away from using all those SMA connectors and jumper.
>
> Thx
>
> Ed G
>
> --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@> wrote:
> >
> > Yep, I know.
> >
> > I'm willing to spend time transferring some of the stable PCBs (such as the MOB, PLL, etc) to eagle, or some other PCB cad program so we can get much cheaper boards. I offered this before, but people seemed resistant to the idea. I know that Sam and Scotty like to use express PCB, so for the in-flux designs it doesn't make sense.
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8002. Re: Circuit Board Source, Holophase OmniGlyph

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-23 00:17:54 UTC
From: inlinebeginner
Topic: 7968 Message: 8002

I agree with Scotty that the ExpressPCB is easy to learn. Also if we convert to other program, we need to try several times to get rid of those errors from the conversion. A lot of people in this group have to learn a new software?
Lin

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
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>
> > I also recall someone saying that once you
> order boards from
>
> > ExpressPCB, you can get the gerbers from
> them. I don't know whether
>
> > that is true, but it would be worth
> checking.
>
> >
>
> > Sam W.
>
> >
>
> > --- In spectrumanalyzer@yahoogroups.com,
> William Dillon <hpux735@>
>
> > wrote:
>
> > >
>
> > > I totally agree... but...
>
> > >
>
> > > I use eagle almost every day. It's not
> open source, but it's still
>
> > > free to use for hobbies. I can't
> justify the expense of learning a
>
> > > new CAD program, and recreating all of
> my libraries. To be honest,
>
> > > I've got a license of Altium Designer,
> which is one of the nicest
>
> > > electronic design programs there is...
> but I don't really use it
>
> > > due to the learning curve.

>
> > > If you'd like to take the charge on
> transferring the designs using
>
> > > KICAD, I think that would be great!
>
> > >
>
> > > - Will
>
> > >
>
> > > On Apr 21, 2011, at 6:45 PM,
> <dave@> <dave@> wrote:
>
> > >
>
> > > >
>
> > > > I use KICAD for my designs. It is
> FREE, open source, and works
>
> > > > on Windows, Linux, and OSX. It
> will output standard Gerber files
>
> > > > which any manufacturer. I think
> whatever CAD system you use
>
> > > > should be available free so
> others can modify for their own use.
>
> > > > I do not order from Far Circuits
> because of the lack of plated
>
> > > > thru holes.
>
> > > >
>
> > > > Dave - WB6DHW
>
> > > > <http://wb6dhw.com>;
>
> > > > -------- Original Message
> --------
>
> > > > Subject: Re: [spectrumanalyzer]
> Circuit Board Source
>
> > > > From: William Dillon
> <hpux735@>

>
> > > > Date: Thu, April 21, 2011 11:11
> am
>
> > > > To: spectrumanalyzer@yahoogroups.com
>
> > > >
>
> > > >
>
> > > > Yep, I know.
>
> > > >
>
> > > > I'm willing to spend time
> transferring some of the stable PCBs
>
> > > > (such as the MOB, PLL, etc) to
> eagle, or some other PCB cad
>
> > > > program so we can get much
> cheaper boards. I offered this before,
>
> > > > but people seemed resistant to
> the idea. I know that Sam and
>
> > > > Scotty like to use express PCB,
> so for the in-flux designs it
>
> > > > doesn't make sense.
>
> > > >
>
> > > > - Will
>
> > > >
>
> > > > On Apr 21, 2011, at 10:58 AM,
> inlinebeginner wrote:
>
> > > >
>
> > > >>
>
> > > >> The free ExpressPCB software
> does not a function to create gerber
>
> > > >> and drill files. That is why
> we could not make the board from
>

> > > >> other PCB factory, which may
> be much cheaper than expressPCB.
>
> > > >> Lin
>
> > > >>
>
> > > >> --- In spectrumanalyzer@yahoogroups.com,
> William Dillon
>
> > > >> <hpux735@> wrote:
>
> > > >> >
>
> > > >> > If you're willing to use
> a program other than expressPCB, there
>
> > > >> > are TONS of great places
> for cheap boards, here are 2 examples:
>
> > > >> >
>
> > > >> > iTead studio:
> Double-sided (plated through holes) 6-6 (min.
>
> > > >> > trace/spacing in mils)
> with soldermask and silkscreen
>
> > > >> > Within 5x5cm square $12
> for 10 boards
>
> > > >> > Within 10x10cm square
> $28 for 10 boards
>
> > > >> >
>
> > > >> > Hey have lots more
> options, but those are the most generic
>
> > > >> > http://iteadstudio.com/store/index.php?main_page=index&cPath=19_20
>
> > > >> >
>
> > > >> > Also, BatchPCB:
> Double-sided (plated through holes) 8-8 (min.
>
> > > >> > trace/spacing in mils)
> with soldermask and silkscreen
>
> > > >> > $0.25 per Sq. inch $10

> setup per order (can be many designs)
>
> > > >> >
>
> > > >> > On Apr 21, 2011, at 7:13
> AM, Robert Fish wrote:
>
> > > >> >
>
> > > >> > > Hi Guys,
>
> > > >> > >
>
> > > >> > > I was surfing the
> web this morning and stumbled across the
>
> > > >> > > Far Circuits
> website while researching a different project.
>
> > > >> > > Far circuits has
> been around for a while.
>
> > > >> > > I have purchased
> pre-made circuit boards from them in the
>
> > > >> > > past.
>
> > > >> > >
>
> > > >> > > Here is the link: http://www.farcircuits.net/
>
> > > >> > >
>
> > > >> > > On their site they
> offer to make boards from ExpressPCB
>
> > > >> > > files.
>
> > > >> > >
>
> > > >> > > Here is the text
> from the pricing page:
>
> > > >> > >
>
> > > >> > > FAR Circuits now
> will accept Express PCB files and make the
>
> > > >> > > required boards
> from your files. Just email mail@ your

>
> > > >> > > Express PCB files.
>
> > > >> > >
>
> > > >> > > Pricing is as
> follows:
>
> > > >> > > All boards are made
> of G-10, FR-4 material, 1 oz. copper,
>
> > > >> > > solder coated, and
> drilled.
>
> > > >> > > Double sided boards
> DO NOT have plated through holes.
>
> > > >> > > Custom boards may
> be made for $.50 square inch or $5.00
>
> > > >> > > minimum per board
> for single sided, etched, drilled and
>
> > > >> > > solder coated. A
> film shot is required for the solder side
>
> > > >> > > and the legend at
> $10.00 per shot.
>
> > > >> > > Custom double sided
> non-plated through holes, etched, drilled
>
> > > >> > > and solder coated
> boards may be made for $.75 per square inch
>
> > > >> > > or $8.00 minimum
> per board. A film shot is required for the
>
> > > >> > > solder side,
> component side, and the legend at $10.00 per
>
> > > >> > > shot.
>
> > > >> > >
>
> > > >> > > Quantity pricing
> available. Far Circuits reserves the right
>
> > > >> > > to change the
> pricing based on the complexity of the board.

>
> > > >> > > FAR Circuits offers
> layout and prototype services. Please
>
> > > >> > > call or us if you
> have any questions.
>
> > > >> > >
>
> > > >> > >
>
> > > >> > > I am not sure I
> understand all of that, or if it is any
>
> > > >> > > cheaper than
> express PCB themselves, but here is the info
>
> > > >> > > never the less. It
> might be a good way to have boards made.
>
> > > >> > >
>
> > > >> > >
>
> > > >> > >
>
> > > >> > > Bob
>
> > > >> > >
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> > > >> >
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8003. Re: [spectrumanalyzer] Re: Call for Help

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-23 14:45:12 UTC
From: Jim Hontoria
Topic: 7949 Message: 8003

I'm about ready to switch back to USB. Mxr buffer famps working. Got the combo RBW board in place. Love the amplifilter although I have an issue with the Xnarrow filter that flattens and spreads out the zero hump horrendously. I'll get back to that later. My VGA seems to be working fine although I see that you have been discussing related issues. YIG is still work in progress, about ready to tackle the software.

Jim

On Fri, Apr 22, 2011 at 8:05 AM, Sam <swetterlin@...> wrote:

>
>
> Jim,
> In theory that should work, but in theory the MUN2211 should have worked
> better than it does. I think what Scotty was looking for is someone to
> actually try out the FET. Those resistors are for limiting the current load
> on the ADC and setting the on/off threshold, and shouldn't be needed for the
> FET.
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
> >
> > Hi Scotty,
> > Is the 2N7002E a drop in replacement? How about the internal resistors in
> the MUN2211?
> >
> > Jim, W1JGH
> >
> > --- In spectrumanalyzer@yahoogroups.com, "william" <wsprowls@> wrote:
> > >
> > > Hi All,
> > > I have determined that the MUN2211 buffer transistor, used in the AtoD
> Converter Module, needs to be replaced with a different device. Although it
> works as intended, it's speed is a bottle neck for the new USB control.
> > > The best possible replacement is an open drain FET that has a gate
> turn-on characteristic of standard CMOS logic.
> > > There are literally hundreds of these devices on the market and I don't
> have the time or testing capability to do the proper research. So, I am
> asking for a little help. Those of you who have a good "junk-box", find one
> and test it in your AtoD module. Here are the requirements:
> > > * Size: SOT-23, SOT-23-3, TO-236, case 318-80. This is the pad size on
> the pwb of the AtoD.
> > > * N-channel
> > > * Enhancement mode

> > > * Gate threshold: 1.0v to 3.0v, 2.5 volt preferred.
> > > * Open Drain
> > > * Pin-outs: Drain, top single pin; Gate, lower left pin; Source, lower
> right pin
> > > * Maximum continuous current: at least 5 ma.
> > > * Maximum drain voltage: at least 10 volts
> > > * Turn-on and turn-off delay: 500 nsec or faster.
> > > * Internal diode protection
> > > * Available at Digikey in single quantities (cheap)
> > >
> > > Here are a couple of devices that meet the reqmts. You can use their
> data sheets as examples in your search.
> > > http://www.onsemi.com/pub_link/Collateral/2N7002E-D.PDF
> > > http://www.diodes.com/datasheets/ZVN3310F.pdf
> > >
> > > If you think you have a good device but cannot test it yourself, post
> to the group and arrange to send it to someone who can test it.
> > >
> > > Scotty
> > >
> >
>
>
>

--
Jim G. Hontoria

8004. Re: Call for Help

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-23 15:08:07 UTC
From: Sam
Topic: 7949 Message: 8004

Jim,
Perhaps your issue with the XNarrow filter is sweep speed. If you scan too fast it can do what you describe. Try reversing the sweep direction to see if the shape changes; if so, the speed is too fast. If using AutoWait, there should be no issue as long as you specified your filter capacitors correctly.

A somewhat related issue: I was doing scans from 100 kHz to 100 MHz and was getting strange things at the low end. Turns out I was using my 400 kHz RBW filter, which I rarely use but I had been testing it. This of course smeared the zero hump across a couple hundred kHz. It took me a while to realize what was happening, and then I felt like an idiot.

Let us know how USB works. I'm particularly interested in its sweep speed compared to the parallel port.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> I'm about ready to switch back to USB. Mxr buffer famps working. Got the
> combo RBW board in place. Love the amplifilter although I have an issue with
> the Xnarrow filter that flattens and spreads out the zero hump
> horrendously. I'll get back to that later. My VGA seems to be working fine
> although I see that you have been discussing related issues. YIG is still
> work in progress, about ready to tackle the software.
>
> Jim
>
> On Fri, Apr 22, 2011 at 8:05 AM, Sam <swetterlin@...> wrote:
>
> >
> >
> > Jim,
> > In theory that should work, but in theory the MUN2211 should have worked
> > better than it does. I think what Scotty was looking for is someone to
> > actually try out the FET. Those resistors are for limiting the current load
> > on the ADC and setting the on/off threshold, and shouldn't be needed for the
> > FET.
> > Sam W.
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
> > >
> > > Hi Scotty,
> > > Is the 2N7002E a drop in replacement? How about the internal resistors in
> > the MUN2211?
> > >

> > > Jim, W1JGH
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "william" <wsprowls@> wrote:
> > > >
> > > > Hi All,
> > > > I have determined that the MUN2211 buffer transistor, used in the AtoD
> > Converter Module, needs to be replaced with a different device. Although it
> > works as intended, it's speed is a bottle neck for the new USB control.
> > > > The best possible replacement is an open drain FET that has a gate
> > turn-on characteristic of standard CMOS logic.
> > > > There are literally hundreds of these devices on the market and I don't
> > have the time or testing capability to do the proper research. So, I am
> > asking for a little help. Those of you who have a good "junk-box", find one
> > and test it in your AtoD module. Here are the requirements:
> > > > * Size: SOT-23, SOT-23-3, TO-236, case 318-80. This is the pad size on
> > the pwb of the AtoD.
> > > > * N-channel
> > > > * Enhancement mode
> > > > * Gate threshold: 1.0v to 3.0v, 2.5 volt preferred.
> > > > * Open Drain
> > > > * Pin-outs: Drain, top single pin; Gate, lower left pin; Source, lower
> > right pin
> > > > * Maximum continuous current: at least 5 ma.
> > > > * Maximum drain voltage: at least 10 volts
> > > > * Turn-on and turn-off delay: 500 nsec or faster.
> > > > * Internal diode protection
> > > > * Available at Digikey in single quantities (cheap)
> > > >
> > > > Here are a couple of devices that meet the reqmts. You can use their
> > data sheets as examples in your search.
> > > > http://www.onsemi.com/pub_link/Collateral/2N7002E-D.PDF
> > > > http://www.diodes.com/datasheets/ZVN3310F.pdf
> > > >
> > > > If you think you have a good device but cannot test it yourself, post
> > to the group and arrange to send it to someone who can test it.
> > > >
> > > > Scotty
> > > >
> > >
> >
> >
> >
>
>
>
> --
> Jim G. Hontoria
>

8005. Re: [spectrumanalyzer] Re: Call for Help

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-23 15:20:26 UTC
From: Jim Hontoria
Topic: 7949 Message: 8005

I run som sweep checks to establish a baseline before I change over.

Jim

On Sat, Apr 23, 2011 at 11:08 AM, Sam <swetterlin@...> wrote:

>
>
> Jim,
> Perhaps your issue with the XNarrow filter is sweep speed. If you scan too
> fast it can do what you describe. Try reversing the sweep direction to see
> if the shape changes; if so, the speed is too fast. If using AutoWait, there
> should be no issue as long as you specified your filter capacitors
> correctly.
>
> A somewhat related issue: I was doing scans from 100 kHz to 100 MHz and was
> getting strange things at the low end. Turns out I was using my 400 kHz RBW
> filter, which I rarely use but I had been testing it. This of course smeared
> the zero hump across a couple hundred kHz. It took me a while to realize
> what was happening, and then I felt like an idiot.
>
> Let us know how USB works. I'm particularly interested in its sweep speed
> compared to the parallel port.
>
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...>
> wrote:
> >
> > I'm about ready to switch back to USB. Mxr buffer famps working. Got the
> > combo RBW board in place. Love the amplifilter although I have an issue
> with
> > the Xnarrow filter that flattens and spreads out the zero hump
> > horrendously. I'll get back to that later. My VGA seems to be working
> fine
> > although I see that you have been discussing related issues. YIG is still
> > work in progress, about ready to tackle the software.
> >
> > Jim
> >
> > On Fri, Apr 22, 2011 at 8:05 AM, Sam <swetterlin@...> wrote:
> >
> > >
> > >
> > > Jim,

> > > In theory that should work, but in theory the MUN2211 should have
> worked
> > > better than it does. I think what Scotty was looking for is someone to
> > > actually try out the FET. Those resistors are for limiting the current
> load
> > > on the ADC and setting the on/off threshold, and shouldn't be needed
> for the
> > > FET.
> > > Sam W.
> > >
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
> > > >
> > > > Hi Scotty,
> > > > Is the 2N7002E a drop in replacement? How about the internal
> resistors in
> > > the MUN2211?
> > > >
> > > > Jim, W1JGH
> > > >
> > > > --- In spectrumanalyzer@...m, "william" <wsprowls@>
> wrote:
> > > > >
> > > > > Hi All,
> > > > > I have determined that the MUN2211 buffer transistor, used in the
> AtoD
> > > Converter Module, needs to be replaced with a different device.
> Although it
> > > works as intended, it's speed is a bottle neck for the new USB control.
> > > > > The best possible replacement is an open drain FET that has a gate
> > > turn-on characteristic of standard CMOS logic.
> > > > > There are literally hundreds of these devices on the market and I
> don't
> > > have the time or testing capability to do the proper research. So, I am
> > > asking for a little help. Those of you who have a good "junk-box", find
> one
> > > and test it in your AtoD module. Here are the requirements:
> > > > > * Size: SOT-23, SOT-23-3, TO-236, case 318-80. This is the pad size
> on
> > > the pwb of the AtoD.
> > > > > * N-channel
> > > > > * Enhancement mode
> > > > > * Gate threshold: 1.0v to 3.0v, 2.5 volt preferred.
> > > > > * Open Drain
> > > > > * Pin-outs: Drain, top single pin; Gate, lower left pin; Source,
> lower
> > > right pin
> > > > > * Maximum continuous current: at least 5 ma.
> > > > > * Maximum drain voltage: at least 10 volts
> > > > > * Turn-on and turn-off delay: 500 nsec or faster.

> > > > > * Internal diode protection
> > > > > * Available at Digikey in single quantities (cheap)
> > > > >
> > > > > Here are a couple of devices that meet the reqmts. You can use
> their
> > > data sheets as examples in your search.
> > > > > http://www.onsemi.com/pub_link/Collateral/2N7002E-D.PDF
> > > > > http://www.diodes.com/datasheets/ZVN3310F.pdf
> > > > >
> > > > > If you think you have a good device but cannot test it yourself,
> post
> > > to the group and arrange to send it to someone who can test it.
> > > > >
> > > > > Scotty
> > > > >
> > > >
> > >
> > >
> > >
> >
> >
> >
> > --
> > Jim G. Hontoria
> >
>
>
>

--
Jim G. Hontoria

8006. Re: [spectrumanalyzer] PLO2 output distortion

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-23 18:56:12 UTC
From: Jurgen
Topic: 7949 Message: 8006

I am testing the PLO2 module using a 6V regulator and find that the 1GHz output has quite a bit of distortion.
According to the scope FFT the 2nd harmonic is down by about 10 dB.
Has anyone had a similar experience.
My output level ~+10dBm into a 50 ohm resistive load.

8007. Re: PLO2 output distortion

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-23 22:07:32 UTC
From: Sam
Topic: 7949 Message: 8007

You are right on target with the data sheet, which shows second harmonic near -10 dBc for the 1-5V tuning range.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> I am testing the PLO2 module using a 6V regulator and find that the 1GHz
> output has quite a bit of distortion.
> According to the scope FFT the 2nd harmonic is down by about 10 dB.
> Has anyone had a similar experience.
> My output level ~+10dBm into a 50 ohm resistive load.
>

8008. Re: [spectrumanalyzer] PLO2 output distortion

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-23 22:54:03 UTC
From: Jim Hontoria
Topic: 7949 Message: 8008

What's your scope bandwidth?

Jim, W1JGH

On Sat, Apr 23, 2011 at 2:56 PM, Jurgen <khj221@...> wrote:

>
>
> I am testing the PLO2 module using a 6V regulator and find that the 1GHz
> output has quite a bit of distortion.
> According to the scope FFT the 2nd harmonic is down by about 10 dB.
> Has anyone had a similar experience.
> My output level ~+10dBm into a 50 ohm resistive load.
>
>

--
Jim G. Hontoria

8009. Re: [spectrumanalyzer] PLO2 output distortion

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-24 00:12:41 UTC
From: Jurgen
Topic: 7949 Message: 8009

20GHz direct coupling. I am probing with a 2.5 GHz probe.

Jurgen

On 4/23/2011 6:54 PM, Jim Hontoria wrote:
> What's your scope bandwidth?
> Jim, W1JGH
>
> On Sat, Apr 23, 2011 at 2:56 PM, Jurgen <khj221@...
> <mailto:khj221@...>> wrote:
>
> I am testing the PLO2 module using a 6V regulator and find that
> the 1GHz output has quite a bit of distortion.
> According to the scope FFT the 2nd harmonic is down by about 10 dB.
> Has anyone had a similar experience.
> My output level ~+10dBm into a 50 ohm resistive load.
>
>
>
>
> --
> Jim G. Hontoria
>

8010. Re: [spectrumanalyzer] PLO2 output distortion

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-24 02:06:20 UTC
From: Jim Hontoria
Topic: 7949 Message: 8010

Impressive.

Jim

On Sat, Apr 23, 2011 at 8:12 PM, Jurgen <khj221@bellsouth.net> wrote:

>
>
> 20GHz direct coupling. I am probing with a 2.5 GHz probe.
>
> Jurgen
>
>
>
> On 4/23/2011 6:54 PM, Jim Hontoria wrote:
>
>
> What's your scope bandwidth?
>
> Jim, W1JGH
>
> On Sat, Apr 23, 2011 at 2:56 PM, Jurgen <khj221@...> wrote:
>
>>
>>
>> I am testing the PLO2 module using a 6V regulator and find that the 1GHz
>> output has quite a bit of distortion.
>> According to the scope FFT the 2nd harmonic is down by about 10 dB.
>> Has anyone had a similar experience.
>> My output level ~+10dBm into a 50 ohm resistive load.
>>
>
>
>
> --
> Jim G. Hontoria
>
>
>

--
Jim G. Hontoria

8011. Wire Resistance

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-24 14:29:16 UTC
From: Sam
Topic: 8011 Message: 8011

I built a relatively crude shunt fixture consisting of two 49.9 ohm resistors (one leading from the input and one leading to the output), both connected to a grounded 10 ohm resistor. The DUT connects to the common connection of the resistors. This is a 16.7 ohm shunt fixture that is optimal for measuring small resistances.

I did Reference calibration, using a 100 ohm resistor as the reference, and measured the resistance of a short piece of #30 wire. The resistance was extremely small--0.012 ohms at 1 MHz and 0.043 ohms at 25 MHz. Yet all indications are that they were accurately measured within a couple of milli-ohms.

I posted a photo of the scan and some explanatory comments:

<http://groups.yahoo.com/group/spectrumanalyzer/photos/album/252922278/pic/1294717754/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>

Measuring resistance with a shunt fixture is very similar in concept to 4-wire Kelvin measurement of DC resistance.

Sam W.

8012. Re: [spectrumanalyzer] Circuit Board Source, Holophase OmniGlyph

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-24 23:38:20 UTC
From: William Dillon
Topic: 7968 Message: 8012

I've finished the first draft of the Master Oscillator board in eagle. I've copied essentially exactly the coax pad that Scotty has designed. The annular ring on the back side is the minimum diameter allowed by most PCB houses (20 mils). I've taken some liberties on the design. I copied exactly the schematic, but omitted the optional components. At some point, I'll have some of these made, and when I do, I'll mail some of them to people that want to beta test it.

I've documented it on my blog's master oscillator page:

http://alternet.us.com/?page_id=753#eagle

- Will

On Apr 22, 2011, at 5:17 PM, inlinebeginner wrote:

> I agree with Scotty that the ExpressPCB is easy to learn. Also if we convert to other program, we need to try several times to get rid of those errors from the conversion. A lot of people in this group have to learn a new software?
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
> >
> > Hi Greg,
> > Â The group has not really set the "defacto standard" for Express. Actually, it was me who has released all of the MSA designs in Express. The reason for that is that it is soooooo easy to use. I have tried Eagle, Circad, and a couple of others. They were not as "user friendly" as Express. Circad just sucks. It is DOS based trying to work in Windows.
> > Â There is certainly no reason someone cannot "redo" the boards in another CAD program.Â The only thing is, there is the potential for "slip-ups" during the change-over process. This has occurred and I was not able to prevent it. Even though Express is much more expensive than everyone else, it is a very convenient program, allowing "cuts and pastes" of different boards to create a larger panel. I will continue to use Express, and any future modifications will be in Express. A change now would require an extensive update to manyÂ existing web pages.
> > Scotty
> >
> > --- On Fri, 4/22/11, Greg Broburg <semiflex@...> wrote:
> >
> > From: Greg Broburg <semiflex@...>
> > Subject: [spectrumanalyzer] Re: Circuit Board Source, Holophase OmniGlyph
> > To: spectrumanalyzer@yahoogroups.com, "Fred Lehman" <flehman@...>
> > Date: Friday, April 22, 2011, 11:16 AM
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> > corroborate on this idea.
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> >
> > >
> >
> > > I also recall someone saying that once you
> > order boards from
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> > > that is true, but it would be worth
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> >
> > >
> >
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> >
> > > > - Will
> >
> > > >
> >
> > > > On Apr 21, 2011, at 6:45 PM,
> > <dave@> <dave@> wrote:
> >
> > > >
> >
> > > > >
> >
> > > > I use KICAD for my designs. It is
> > FREE, open source, and works
> >
> > > > on Windows, Linux, and OSX. It
> > will output standard Gerber files
> >
> > > > which any manufacturer. I think
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> >

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> > > > > Dave - WB6DHW
> >
> > > > > <http://wb6dhw.com>;
> >
> > > > > -------- Original Message
> > --------
> >
> > > > > Subject: Re: [spectrumanalyzer]
> > Circuit Board Source
> >
> > > > > From: William Dillon
> > <hpux735@>
> >
> > > > > Date: Thu, April 21, 2011 11:11
> > am
> >
> > > > > To: spectrumanalyzer@yahoogroups.com
> >
> > > > > >
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> > > > > Yep, I know.
> >
> > > > > >
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> > > > > I'm willing to spend time
> > transferring some of the stable PCBs
> >
> > > > > (such as the MOB, PLL, etc) to
> > eagle, or some other PCB cad
> >
> > > > > program so we can get much
> > cheaper boards. I offered this before,
> >
> > > > > but people seemed resistant to
> > the idea. I know that Sam and
> >
> > > > > Scotty like to use express PCB,
> > so for the in-flux designs it
> >
> > > > > doesn't make sense.
> >
> > > > > >
> >
> > > > > - Will
> >
> > > > > >

> >
> > > > > On Apr 21, 2011, at 10:58 AM,
> > inlinebeginner wrote:
> >
> > > > >
> >
> > > > >>
> >
> > > > >> The free ExpressPCB software
> > does not a function to create gerber
> >
> > > > >> and drill files. That is why
> > we could not make the board from
> >
> > > > >> other PCB factory, which may
> > be much cheaper than expressPCB.
> >
> > > > >> Lin
> >
> > > > >>
> >
> > > > >> --- In spectrumanalyzer@yahoogroups.com,
> > William Dillon
> >
> > > > >> <hpux735@> wrote:
> >
> > > > >> >
> >
> > > > >> > If you're willing to use
> > a program other than expressPCB, there
> >
> > > > >> > are TONS of great places
> > for cheap boards, here are 2 examples:
> >
> > > > >> >
> >
> > > > >> > iTead studio:
> > Double-sided (plated through holes) 6-6 (min.
> >
> > > > >> > trace/spacing in mils)
> > with soldermask and silkscreen
> >
> > > > >> > Within 5x5cm square $12
> > for 10 boards
> >
> > > > >> > Within 10x10cm square
> > $28 for 10 boards
> >
> > > > >> >
> >

> > > > >> > Hey have lots more
> > options, but those are the most generic
> >
> > > > >> > http://iteadstudio.com/store/index.php?main_page=index&cPath=19_20
> >
> > > > >> >
> >
> > > > >> > Also, BatchPCB:
> > Double-sided (plated through holes) 8-8 (min.
> >
> > > > >> > trace/spacing in mils)
> > with soldermask and silkscreen
> >
> > > > >> > $0.25 per Sq. inch $10
> > setup per order (can be many designs)
> >
> > > > >> >
> >
> > > > >> > On Apr 21, 2011, at 7:13
> > AM, Robert Fish wrote:
> >
> > > > >> >
> >
> > > > >> > > Hi Guys,
> >
> > > > >> > >
> >
> > > > >> > > I was surfing the
> > web this morning and stumbled across the
> >
> > > > >> > > Far Circuits
> > website while researching a different project.
> >
> > > > >> > > Far circuits has
> > been around for a while.
> >
> > > > >> > > I have purchased
> > pre-made circuit boards from them in the
> >
> > > > >> > > past.
> >
> > > > >> > >
> >
> > > > >> > > Here is the link: http://www.farcircuits.net/
> >
> > > > >> > >
> >
> > > > >> > > On their site they
> > offer to make boards from ExpressPCB
> >

> > > > >> > > files.
> >
> > > > >> > >
> >
> > > > >> > > Here is the text
> > from the pricing page:
> >
> > > > >> > >
> >
> > > > >> > > FAR Circuits now
> > will accept Express PCB files and make the
> >
> > > > >> > > required boards
> > from your files. Just email mail@ your
> >
> > > > >> > > Express PCB files.
> >
> > > > >> > >
> >
> > > > >> > > Pricing is as
> > follows:
> >
> > > > >> > > All boards are made
> > of G-10, FR-4 material, 1 oz. copper,
> >
> > > > >> > > solder coated, and
> > drilled.
> >
> > > > >> > > Double sided boards
> > DO NOT have plated through holes.
> >
> > > > >> > > Custom boards may
> > be made for $.50 square inch or $5.00
> >
> > > > >> > > minimum per board
> > for single sided, etched, drilled and
> >
> > > > >> > > solder coated. A
> > film shot is required for the solder side
> >
> > > > >> > > and the legend at
> > $10.00 per shot.
> >
> > > > >> > > Custom double sided
> > non-plated through holes, etched, drilled
> >
> > > > >> > > and solder coated
> > boards may be made for $.75 per square inch
> >
> > > > >> > > or $8.00 minimum

> > per board. A film shot is required for the
> >
> > > > >> > > solder side,
> > component side, and the legend at $10.00 per
> >
> > > > >> > > shot.
> >
> > > > >> > >
> >
> > > > >> > > Quantity pricing
> > available. Far Circuits reserves the right
> >
> > > > >> > > to change the
> > pricing based on the complexity of the board.
> >
> > > > >> > > FAR Circuits offers
> > layout and prototype services. Please
> >
> > > > >> > > call or us if you
> > have any questions.
> >
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> > > > >> > > I am not sure I
> > understand all of that, or if it is any
> >
> > > > >> > > cheaper than
> > express PCB themselves, but here is the info
> >
> > > > >> > > never the less. It
> > might be a good way to have boards made.
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> > > > >> > > Bob
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8013. Re: Circuit Board Source, Holophase OmniGlyph

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-25 12:59:01 UTC
From: Sam
Topic: 7968 Message: 8013

Looks very nice. It would be a good idea to keep the board clear of solder mask for a 40 mil boundary on top and bottom, for soldering fencing. In fact, I would suggest keeping the entire bottom clear of solder mask, except where you need it as backing for labels.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> I've finished the first draft of the Master Oscillator board in eagle. I've copied essentially exactly the coax pad that Scotty has designed. The annular ring on the back side is the minimum diameter allowed by most PCB houses (20 mils). I've taken some liberties on the design. I copied exactly the schematic, but omitted the optional components. At some point, I'll have some of these made, and when I do, I'll mail some of them to people that want to beta test it.
>
> I've documented it on my blog's master oscillator page:
>
> http://alternet.us.com/?page_id=753#eagle
>
> - Will
>
> On Apr 22, 2011, at 5:17 PM, inlinebeginner wrote:
>
> > I agree with Scotty that the ExpressPCB is easy to learn. Also if we convert to other program, we need to try several times to get rid of those errors from the conversion. A lot of people in this group have to learn a new software?
> > Lin
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> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
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> > > Â The group has not really set the "defacto standard" for Express. Actually, it was me who has released all of the MSA designs in Express. The reason for that is that it is soooooo easy to use. I have tried Eagle, Circad, and a couple of others. They were not as "user friendly" as Express. Circad just sucks. It is DOS based trying to work in Windows.
> > > Â There is certainly no reason someone cannot "redo" the boards in another CAD program.Â The only thing is, there is the potential for "slip-ups" during the change-over process. This has occurred and I was not able to prevent it. Even though Express is much more expensive than everyone else, it is a very convenient program, allowing "cuts and pastes" of different boards to create a larger panel. I will continue to use Express, and any future modifications will be in Express. A change now would require an extensive update to manyÂ existing web pages.
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> > >
> > > > > > Scotty like to use express PCB,
> > > so for the in-flux designs it

> > >
> > > > > > doesn't make sense.
> > >
> > > > > >
> > >
> > > > > > - Will
> > >
> > > > > >
> > >
> > > > > > On Apr 21, 2011, at 10:58 AM,
> > > inlinebeginner wrote:
> > >
> > > > > >
> > >
> > > > > >>
> > >
> > > > > >> The free ExpressPCB software
> > > does not a function to create gerber
> > >
> > > > > >> and drill files. That is why
> > > we could not make the board from
> > >
> > > > > >> other PCB factory, which may
> > > be much cheaper than expressPCB.
> > >
> > > > > >> Lin
> > >
> > > > > >>
> > >
> > > > > >> --- In spectrumanalyzer@yahoogroups.com,
> > > William Dillon
> > >
> > > > > >> <hpux735@> wrote:
> > >
> > > > > >> >
> > >
> > > > > >> > If you're willing to use
> > > a program other than expressPCB, there
> > >
> > > > > >> > are TONS of great places
> > > for cheap boards, here are 2 examples:
> > >
> > > > > >> >
> > >
> > > > > >> > iTead studio:
> > > Double-sided (plated through holes) 6-6 (min.
> > >
> > > > > >> > trace/spacing in mils)
> > > with soldermask and silkscreen
> > >

> > > > > >> > Within 5x5cm square $12
> > > for 10 boards
> > >
> > > > > >> > Within 10x10cm square
> > > $28 for 10 boards
> > >
> > > > > >> >
> > >
> > > > > >> > Hey have lots more
> > > options, but those are the most generic
> > >
> > > > > >> > http://iteadstudio.com/store/index.php?main_page=index&cPath=19_20
> > >
> > > > > >> >
> > >
> > > > > >> > Also, BatchPCB:
> > > Double-sided (plated through holes) 8-8 (min.
> > >
> > > > > >> > trace/spacing in mils)
> > > with soldermask and silkscreen
> > >
> > > > > >> > $0.25 per Sq. inch $10
> > > setup per order (can be many designs)
> > >
> > > > > >> >
> > >
> > > > > >> > On Apr 21, 2011, at 7:13
> > > AM, Robert Fish wrote:
> > >
> > > > > >> >
> > >
> > > > > >> > > Hi Guys,
> > >
> > > > > >> > >
> > >
> > > > > >> > > I was surfing the
> > > web this morning and stumbled across the
> > >
> > > > > >> > > Far Circuits
> > > website while researching a different project.
> > >
> > > > > >> > > Far circuits has
> > > been around for a while.
> > >
> > > > > >> > > I have purchased
> > > pre-made circuit boards from them in the
> > >
> > > > > >> > > past.
> > >
> > > > > >> > >

> > >
> > > > > >> > > Here is the link: http://www.farcircuits.net/
> > >
> > > > > >> > >
> > >
> > > > > >> > > On their site they
> > > offer to make boards from ExpressPCB
> > >
> > > > > >> > > files.
> > >
> > > > > >> > >
> > >
> > > > > >> > > Here is the text
> > > from the pricing page:
> > >
> > > > > >> > >
> > >
> > > > > >> > > FAR Circuits now
> > > will accept Express PCB files and make the
> > >
> > > > > >> > > required boards
> > > from your files. Just email mail@ your
> > >
> > > > > >> > > Express PCB files.
> > >
> > > > > >> > >
> > >
> > > > > >> > > Pricing is as
> > > follows:
> > >
> > > > > >> > > All boards are made
> > > of G-10, FR-4 material, 1 oz. copper,
> > >
> > > > > >> > > solder coated, and
> > > drilled.
> > >
> > > > > >> > > Double sided boards
> > > DO NOT have plated through holes.
> > >
> > > > > >> > > Custom boards may
> > > be made for $.50 square inch or $5.00
> > >
> > > > > >> > > minimum per board
> > > for single sided, etched, drilled and
> > >
> > > > > >> > > solder coated. A
> > > film shot is required for the solder side
> > >
> > > > > >> > > and the legend at
> > > $10.00 per shot.

> > >
> > > > > >> > > Custom double sided
> > > non-plated through holes, etched, drilled
> > >
> > > > > >> > > and solder coated
> > > boards may be made for $.75 per square inch
> > >
> > > > > >> > > or $8.00 minimum
> > > per board. A film shot is required for the
> > >
> > > > > >> > > solder side,
> > > component side, and the legend at $10.00 per
> > >
> > > > > >> > > shot.
> > >
> > > > > >> > >
> > >
> > > > > >> > > Quantity pricing
> > > available. Far Circuits reserves the right
> > >
> > > > > >> > > to change the
> > > pricing based on the complexity of the board.
> > >
> > > > > >> > > FAR Circuits offers
> > > layout and prototype services. Please
> > >
> > > > > >> > > call or us if you
> > > have any questions.
> > >
> > > > > >> > >
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> > > > > >> > >
> > >
> > > > > >> > > I am not sure I
> > > understand all of that, or if it is any
> > >
> > > > > >> > > cheaper than
> > > express PCB themselves, but here is the info
> > >
> > > > > >> > > never the less. It
> > > might be a good way to have boards made.
> > >
> > > > > >> > >
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> > > > > >> > >
> > >
> > > > > >> > > Bob
> > >

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8014. Re: I have built some modules which is easier and inexpensive

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-25 13:34:26 UTC
From: taishan_ma
Topic: 7586 Message: 8014

--- In spectrumanalyzer@yahoogroups.com, "taishan_ma" <taishan_ma@...> wrote:
>
> hello,
>
> I have built some modules which is easier and inexpensive. Hopefully it can work well. http://www.qsl.net/bg6khc/
>
> bg6khc
>

you can reach it at:

http://cgi.ebay.com/s53mv-type-2-3G-VCO-PLL-4113-AD4116-PCB-/220774793402?pt=LH_DefaultDomain_0&hash=item33673400ba#ht_500wt_1156

thanks!

bg6khc

8015. Re: [spectrumanalyzer] Circuit Board Source, Holophase OmniGlyph

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-25 14:17:26 UTC
From: William Dillon
Topic: 7968 Message: 8015

D'oh! Thanks Sam.

On Apr 25, 2011, at 5:59 AM, Sam wrote:

> Looks very nice. It would be a good idea to keep the board clear of solder mask for a 40 mil boundary on top and bottom, for soldering fencing. In fact, I would suggest keeping the entire bottom clear of solder mask, except where you need it as backing for labels.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
> >
> > I've finished the first draft of the Master Oscillator board in eagle. I've copied essentially exactly the coax pad that Scotty has designed. The annular ring on the back side is the minimum diameter allowed by most PCB houses (20 mils). I've taken some liberties on the design. I copied exactly the schematic, but omitted the optional components. At some point, I'll have some of these made, and when I do, I'll mail some of them to people that want to beta test it.
> >
> > I've documented it on my blog's master oscillator page:
> >
> > http://alternet.us.com/?page_id=753#eagle
> >
> > - Will
> >
> > On Apr 22, 2011, at 5:17 PM, inlinebeginner wrote:
> >
> > > I agree with Scotty that the ExpressPCB is easy to learn. Also if we convert to other program, we need to try several times to get rid of those errors from the conversion. A lot of people in this group have to learn a new software?
> > > Lin
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > > >
> > > > Hi Greg,
> > > > Â The group has not really set the "defacto standard" for Express. Actually, it was me who has released all of the MSA designs in Express. The reason for that is that it is soooooo easy to use. I have tried Eagle, Circad, and a couple of others. They were not as "user friendly" as Express. Circad just sucks. It is DOS based trying to work in Windows.
> > > > Â There is certainly no reason someone cannot "redo" the boards in another CAD program.Â The only thing is, there is the potential for "slip-ups" during the change-over process. This has occurred and I was not able to prevent it. Even though Express is much more expensive than everyone else, it is a very convenient program, allowing "cuts and pastes" of different boards to create a larger panel. I will continue to use Express, and any future modifications will be in Express. A change now would require an extensive update to manyÂ existing web pages.

> > > > Scotty
> > > >
> > > > --- On Fri, 4/22/11, Greg Broburg <semiflex@> wrote:
> > > >
> > > > From: Greg Broburg <semiflex@>
> > > > Subject: [spectrumanalyzer] Re: Circuit Board Source, Holophase OmniGlyph
> > > > To: spectrumanalyzer@yahoogroups.com, "Fred Lehman" <flehman@>
> > > > Date: Friday, April 22, 2011, 11:16 AM
> > > >
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> > > >
> > > > Hello group;
> > > >
> > > >
> > > >
> > > > I have watched this discussion about PCB layout tool issues for
> > > >
> > > > several years. I have been a user of Holophase Circad/OmniGlyph
> > > >
> > > > for many years. In addition I have supported many new users who
> > > >
> > > > have wanted to learn this program. I understand that ExpressPCB
> > > >
> > > > is now a defacto standard for our group. These files can be,
> > > >
> > > > perhaps already have been converted to Circad format.
> > > >
> > > >
> > > >
> > > > The demonstration version of OmniGlyph is available free on
> > > >
> > > > the www.holophase.com website and is mostly complete in that

> > > >
> > > > it allows an unlimited PCB/schematic/drawing file capture. These
> > > >
> > > > files are generally open to saving and sharing among the users
> > > >
> > > > and are not tied to any PCB production company. The issue of
> > > >
> > > > post production to Gerber generation is the issue which requires
> > > >
> > > > a little bit of money in one way shape or form to make up for the
> > > >
> > > > idea of using the demo program concept as a starting point. I
> > > >
> > > > have talked to Fred Lehman owner of Holophase about an idea
> > > >
> > > > to make the demo program a foundation for people who want to
> > > >
> > > > corroborate on this idea.
> > > >
> > > >
> > > >
> > > > Any thoughts?
> > > >
> > > >
> > > >
> > > > Regards;
> > > >
> > > >
> > > >
> > > > Greg
> > > >
> > > >
> > > >
> > > >
> > > >
> > > >
> > > >
> > > >
> > > >
> > > >
> > > > On 4/22/2011 8:14 AM, William Dillon wrote:
> > > >
> > > > Â
> > > >
> > > >
> > > > Sam,
> > > >
> > > >
> > > >
> > > > Yes and no.
> > > >

> > > >
> > > >
> > > > You can make some simple changes, like adding a bit of
> > > > copper here and theres, but anything large would be next
> > > > to impossible. Â The gerber format is truly bizarre. Â It
> > > > also doesn't contain any net list information. Â It is
> > > > nothing more than "apertures," which are basic shapes like
> > > > a square or circle, and paths which are commands like:
> > > > open the shutter, move to this x,y, close the shutter,
> > > > etc.
> > > >
> > > >
> > > >
> > > > I've spent about 20 minutes on the MOB while watching
> > > > TV and it's getting close to being done. Â I have one
> > > > question about the coax connections though. Â It has a
> > > > quality that I'm not sure how to reproduce. Â On the
> > > > construction pageÂ http://www.scottyspectrumanalyzer.com/construction.html
> > > > it looks like the signal pad has different annulus
> > > > diameters on one side of the board than the other. Â Is
> > > > this true, or is it just a fluke?
> > > >
> > > >
> > > >
> > > > Thanks,
> > > > - Will
> > > >
> > > >
> > > >
> > > > On Apr 22, 2011, at 5:40 AM, Sam wrote:
> > > >
> > > >
> > > >
> > > >
> > > > Â
> > > >
> > > > If we had gerber files, could they be imported
> > > > and modified in Eagle, KICAD or some other
> > > > program? I'm guessing you could make simple
> > > > modifications with some sort of graphics editor,
> > > > but wouldn't be able to recreate the board as a
> > > > collection of traces and pads that could be
> > > > individually moved, deleted, etc.
> > > >
> > > > Sam W.
> > > >
> > > >
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com,
> > > > "w4zcb" <w4zcb@> wrote:

> > > >
> > > > >
> > > >
> > > > > Yes, I bought the Gerbers from Express
> > > > years ago for the original N2PK
> > > >
> > > > > VNA boards. Giancarlo then had boards made
> > > > in EU for pennies on the
> > > >
> > > > > dollar. At that time after Express had made
> > > > the originals, you could
> > > >
> > > > > purchase the Gerbers from them for $75.
> > > >
> > > > >
> > > >
> > > > > W4ZCB
> > > >
> > > > >
> > > >
> > > > > Eagle will also produce gerbers, but many
> > > > manufacturers take the Eagle
> > > >
> > > > > files directly. I used to use Eagle a lot,
> > > > and loved it. I tried
> > > >
> > > > > KICAD, and never really took to it. But I'd
> > > > say that if anyone wants
> > > >
> > > > > to convert the layouts, they can use any
> > > > program they want!
> > > >
> > > > >
> > > >
> > > > > I also recall someone saying that once you
> > > > order boards from
> > > >
> > > > > ExpressPCB, you can get the gerbers from
> > > > them. I don't know whether
> > > >
> > > > > that is true, but it would be worth
> > > > checking.
> > > >
> > > > >
> > > >
> > > > > Sam W.
> > > >
> > > > >
> > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com,

> > > > William Dillon <hpux735@>
> > > >
> > > > > wrote:
> > > >
> > > > > >
> > > >
> > > > > > I totally agree... but...
> > > >
> > > > > >
> > > >
> > > > > > I use eagle almost every day. It's not
> > > > open source, but it's still
> > > >
> > > > > > free to use for hobbies. I can't
> > > > justify the expense of learning a
> > > >
> > > > > > new CAD program, and recreating all of
> > > > my libraries. To be honest,
> > > >
> > > > > > I've got a license of Altium Designer,
> > > > which is one of the nicest
> > > >
> > > > > > electronic design programs there is...
> > > > but I don't really use it
> > > >
> > > > > > due to the learning curve.
> > > >
> > > > > > If you'd like to take the charge on
> > > > transferring the designs using
> > > >
> > > > > > KICAD, I think that would be great!
> > > >
> > > > > >
> > > >
> > > > > > - Will
> > > >
> > > > > >
> > > >
> > > > > > On Apr 21, 2011, at 6:45 PM,
> > > > <dave@> <dave@> wrote:
> > > >
> > > > > >
> > > >
> > > > > > >
> > > >
> > > > > > I use KICAD for my designs. It is
> > > > FREE, open source, and works
> > > >
> > > > > > on Windows, Linux, and OSX. It
> > > > will output standard Gerber files

> > > >
> > > > > > > which any manufacturer. I think
> > > > whatever CAD system you use
> > > >
> > > > > > > should be available free so
> > > > others can modify for their own use.
> > > >
> > > > > > > I do not order from Far Circuits
> > > > because of the lack of plated
> > > >
> > > > > > > thru holes.
> > > >
> > > > > > >
> > > >
> > > > > > > Dave - WB6DHW
> > > >
> > > > > > > <http://wb6dhw.com>;
> > > >
> > > > > > > -------- Original Message
> > > > --------
> > > >
> > > > > > > Subject: Re: [spectrumanalyzer]
> > > > Circuit Board Source
> > > >
> > > > > > > From: William Dillon
> > > > <hpux735@>
> > > >
> > > > > > > Date: Thu, April 21, 2011 11:11
> > > > am
> > > >
> > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > >
> > > > > > >
> > > >
> > > > > > >
> > > >
> > > > > > >
> > > > > > > Yep, I know.
> > > >
> > > > > > >
> > > >
> > > > > > > I'm willing to spend time
> > > > transferring some of the stable PCBs
> > > >
> > > > > > > (such as the MOB, PLL, etc) to
> > > > eagle, or some other PCB cad
> > > >
> > > > > > > program so we can get much
> > > > cheaper boards. I offered this before,
> > > >
> > > > > > > but people seemed resistant to

> > > > the idea. I know that Sam and
> > > >
> > > > > > > Scotty like to use express PCB,
> > > > so for the in-flux designs it
> > > >
> > > > > > > doesn't make sense.
> > > >
> > > > > > >
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> > > > > > > - Will
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> > > > > > >
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> > > >
> > > > > > >> and drill files. That is why
> > > > we could not make the board from
> > > >
> > > > > > >> other PCB factory, which may
> > > > be much cheaper than expressPCB.
> > > >
> > > > > > >> Lin
> > > >
> > > > > > >>
> > > >
> > > > > > >> --- In spectrumanalyzer@yahoogroups.com,
> > > > William Dillon
> > > >
> > > > > > >> <hpux735@> wrote:
> > > >
> > > > > > >> >
> > > >
> > > > > > >> > If you're willing to use
> > > > a program other than expressPCB, there
> > > >
> > > > > > >> > are TONS of great places
> > > > for cheap boards, here are 2 examples:
> > > >
> > > > > > >> >
> > > >
> > > > > > >> > iTead studio:
> > > > Double-sided (plated through holes) 6-6 (min.

> > > >
> > > > > > >> > trace/spacing in mils)
> > > > with soldermask and silkscreen
> > > >
> > > > > > >> > Within 5x5cm square $12
> > > > for 10 boards
> > > >
> > > > > > >> > Within 10x10cm square
> > > > $28 for 10 boards
> > > >
> > > > > > >> >
> > > >
> > > > > > >> > Hey have lots more
> > > > options, but those are the most generic
> > > >
> > > > > > >> > http://iteadstudio.com/store/index.php?main_page=index&cPath=19_20
> > > >
> > > > > > >> >
> > > >
> > > > > > >> > Also, BatchPCB:
> > > > Double-sided (plated through holes) 8-8 (min.
> > > >
> > > > > > >> > trace/spacing in mils)
> > > > with soldermask and silkscreen
> > > >
> > > > > > >> > $0.25 per Sq. inch $10
> > > > setup per order (can be many designs)
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> > > > AM, Robert Fish wrote:
> > > >
> > > > > > >> >
> > > >
> > > > > > >> > > Hi Guys,
> > > >
> > > > > > >> > >
> > > >
> > > > > > >> > > I was surfing the
> > > > web this morning and stumbled across the
> > > >
> > > > > > >> > > Far Circuits
> > > > website while researching a different project.
> > > >
> > > > > > >> > > Far circuits has
> > > > been around for a while.
> > > >
> > > > > > >> > > I have purchased
> > > > pre-made circuit boards from them in the

> > > >
> > > > > > >> > > past.
> > > >
> > > > > > >> > >
> > > >
> > > > > > >> > > Here is the link: http://www.farcircuits.net/
> > > >
> > > > > > >> > >
> > > >
> > > > > > >> > > On their site they
> > > > offer to make boards from ExpressPCB
> > > >
> > > > > > >> > > files.
> > > >
> > > > > > >> > >
> > > >
> > > > > > >> > > Here is the text
> > > > from the pricing page:
> > > >
> > > > > > >> > >
> > > >
> > > > > > >> > > FAR Circuits now
> > > > will accept Express PCB files and make the
> > > >
> > > > > > >> > > required boards
> > > > from your files. Just email mail@ your
> > > >
> > > > > > >> > > Express PCB files.
> > > >
> > > > > > >> > >
> > > >
> > > > > > >> > > Pricing is as
> > > > follows:
> > > >
> > > > > > >> > > All boards are made
> > > > of G-10, FR-4 material, 1 oz. copper,
> > > >
> > > > > > >> > > solder coated, and
> > > > drilled.
> > > >
> > > > > > >> > > Double sided boards
> > > > DO NOT have plated through holes.
> > > >
> > > > > > >> > > Custom boards may
> > > > be made for $.50 square inch or $5.00
> > > >
> > > > > > >> > > minimum per board
> > > > for single sided, etched, drilled and
> > > >
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> > > > film shot is required for the solder side
> > > >
> > > > > > >> > > and the legend at
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> > > >
> > > > > > >> > > Custom double sided
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> > > >
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> > > >
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> > > > per board. A film shot is required for the
> > > >
> > > > > > >> > > solder side,
> > > > component side, and the legend at $10.00 per
> > > >
> > > > > > >> > > shot.
> > > >
> > > > > > >> > >
> > > >
> > > > > > >> > > Quantity pricing
> > > > available. Far Circuits reserves the right
> > > >
> > > > > > >> > > to change the
> > > > pricing based on the complexity of the board.
> > > >
> > > > > > >> > > FAR Circuits offers
> > > > layout and prototype services. Please
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> > > > > > >> > > call or us if you
> > > > have any questions.
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> > > > > > >> > > I am not sure I
> > > > understand all of that, or if it is any
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> > > > > > >> > > cheaper than
> > > > express PCB themselves, but here is the info
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> > > > > > >> > > never the less. It
> > > > might be a good way to have boards made.
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8016. Re: Log Det/VGA Ckt Values for Expanded Log Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-25 21:16:38 UTC
From: lh1907
Topic: 7975 Message: 8016

Sam,

After looking at the latest VGA/NF schematics, I'm understand what to change on the VGA schematic (Rev 1.1, 9/10/10) to build the Rev 1.1, 9/25/10 version of this module. i.e.; Since the VGA PCB on hand is the "VGA 5/16/08" version, the following modifications apply:
1. Omit C10A and R2B; wire jumper R2B pads,
2. Add C10, 10 nF,
3. Change following resistor values: R2 = 10K ohms, R2A = 27K ohms.

And the related usage of Scotty's Log Detector is:
R6 = 100 ohms, and J2 only is used to interface to VGA Fdbk input, J2A circuitry not needed.

The NF PCB on hand is marked NF 5/10 but I ordered parts based on values on the Rev 1.2, 9/10/10 schematic which has a PCB file marked as NF 9/10. Since the latest NF schematic (Rev 1.2, 11/12/10) is significantly different, I need to "stay the course" and update the NF 5/10 PCB to the 9/10/10 schematic. So far, the only change I located is a trace cut and jumper add to move U1-6 Vdd connection from +5 vdc to +10 vdc voltage source.

Do any other mods apply to NF 5/10 PCB version?

Larry, W2HHV

These PCBs on hand are from the panel offered in Aug 2010 Group Buy.
--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Larry,
> The Expanded Log Detector has gone through some evolution, so there are various schematics floating around. Originally, it required modifying the Log Detector to split the detector output to two SMA connectors. Then I modified the VGA so the Log Detector could be used in its original form, with the detector output run to the VGA as feedback, and the VGA having an extra output to run that same signal to the ADC. The most current schematic is the one on my web site called "Even more updated Schematic and Layout", and can be downloaded here:
>
> <http://www.wetterlin.org/sam/SA/ExpandedLogDetect/SimpleExpandedLog.zip>
>
> The present arrangement adds the VGA and noise filter in front of the standard Log Detector. But it is also possible to change R6 on the Log Detector to 100 ohms to increase the RF output level. You also have a choice between a fixed noise filter or the switchable one. The latter should give a bit more low end range with narrow RBW filters. I have not actually built the switchable noise filter as currently designed. I built and am using an earlier, more cumbersome version, though it works well.
>
> When using the Expanded Log Detector, the IF2 amp can be replaced with a 28 dB version that is also on my web site:

>
> <http://www.wetterlin.org/sam/SA/ExpandedLogDetect/IF2Amp_OPA847.zip>
>
> It will draw about 45 mA less current than the original IF Amp, and provides 12 dB less gain to avoid overloading RBW filters. But if you have the original IF Amp, you can use it, adding some output attenuation if you want to reduce the gain.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@> wrote:
> >
> > After reviewing the following info:
> >
> > 1. Expanded-Range Log Detector, updated 9/25/10 (Sam W's white paper);
> > 2. Following schematics in ExpandedLog.sch file:
> > a. Log Detector, Rev 1.1, 3/15/10, and
> > b. VGA, Rev 1.1, 9/10/10; and
> > 3.Log Detect PCB SEW Mod 3/15/10.
> >
> > I could not reconcile the following aspects of Fdbk interface from Log Det to VGA.
> >
> > A. The R/C values at Log Det MagVolts source is 220 ohm/0.01 uF (2b note) vs 2.7 kohms/0.001 uF (2a - R7/C13).
> >
> > B Log Det R6 value is 75 ohms (3 note) vs 100 ohm (1) on page 5.
> >
> > C. VGA R2 value is 3.0 kohms (2b) vs short (1) on page 8.
> >
> > In the Expanded Log Amp configuration, since the MagVolts source for ADC is VGA rather than Log Det, can the J2 Log Det connector be used as the source for VGA Fdbk input rather than Log Det J2A?
> >
> > Larry, W2HHV
> >
>

8017. Re: Log Det/VGA Ckt Values for Expanded Log Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-25 23:14:03 UTC
From: Sam
Topic: 7975 Message: 8017

Larry,
The changes on the VGA are as you describe, affecting only the feedback path from the log detector.

If you actually have Scotty's log detector PCB, the J2a components aren't even present, but if you have a board containing them you are correct to omit them. The change of R6 to 100 ohms is correct.

Your "old" switched noise filter will work fine (that is the one I am using), with the trace change you describe. I didn't do this, but it would be a good idea to make the new +10V connection for the op amp through a resistor (4.7-10 ohms) or a ferrite effective at 10.7 MHz. I also ended up with R5=680, R4=470 which may or may not be an improvement. The schematic also does not show the complete jumpering of the two filter outputs (marked N and W for narrow and wide) to the switch. How you do it depends on which noise filter you want to use with which RBW. I used the wide noise filter for the two widest RBW (paths 1 and 2) and the narrow noise filter for the others (paths 3 and 4). This means the wide filter goes to pins S1 and S2 of U2, and the narrow filter goes to S3 and S4. Each pin S1-S4 connects to a pad for jumpering. The PCB connects the pads for S2 and S4 so I had to cut that connection.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@...> wrote:
>
> Sam,
>
> After looking at the latest VGA/NF schematics, I'm understand what to change on the VGA schematic (Rev 1.1, 9/10/10) to build the Rev 1.1, 9/25/10 version of this module. i.e.; Since the VGA PCB on hand is the "VGA 5/16/08" version, the following modifications apply:
> 1. Omit C10A and R2B; wire jumper R2B pads,
> 2. Add C10, 10 nF,
> 3. Change following resistor values: R2 = 10K ohms, R2A = 27K ohms.
>
> And the related usage of Scotty's Log Detector is:
> R6 = 100 ohms, and J2 only is used to interface to VGA Fdbk input, J2A circuitry not needed.
>
> The NF PCB on hand is marked NF 5/10 but I ordered parts based on values on the Rev 1.2, 9/10/10 schematic which has a PCB file marked as NF 9/10. Since the latest NF schematic (Rev 1.2, 11/12/10) is significantly different, I need to "stay the course" and update the NF 5/10 PCB to the 9/10/10 schematic. So far, the only change I located is a trace cut and jumper add to move U1-6 Vdd connection from +5 vdc to +10 vdc voltage source.
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> Larry, W2HHV

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> These PCBs on hand are from the panel offered in Aug 2010 Group Buy.
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Larry,
> > The Expanded Log Detector has gone through some evolution, so there are various schematics floating around. Originally, it required modifying the Log Detector to split the detector output to two SMA connectors. Then I modified the VGA so the Log Detector could be used in its original form, with the detector output run to the VGA as feedback, and the VGA having an extra output to run that same signal to the ADC. The most current schematic is the one on my web site called "Even more updated Schematic and Layout", and can be downloaded here:
> >
> > <http://www.wetterlin.org/sam/SA/ExpandedLogDetect/SimpleExpandedLog.zip>
> >
> > The present arrangement adds the VGA and noise filter in front of the standard Log Detector. But it is also possible to change R6 on the Log Detector to 100 ohms to increase the RF output level. You also have a choice between a fixed noise filter or the switchable one. The latter should give a bit more low end range with narrow RBW filters. I have not actually built the switchable noise filter as currently designed. I built and am using an earlier, more cumbersome version, though it works well.
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> > When using the Expanded Log Detector, the IF2 amp can be replaced with a 28 dB version that is also on my web site:
> >
> > <http://www.wetterlin.org/sam/SA/ExpandedLogDetect/IF2Amp_OPA847.zip>
> >
> > It will draw about 45 mA less current than the original IF Amp, and provides 12 dB less gain to avoid overloading RBW filters. But if you have the original IF Amp, you can use it, adding some output attenuation if you want to reduce the gain.
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@> wrote:
> > >
> > > After reviewing the following info:
> > >
> > > 1. Expanded-Range Log Detector, updated 9/25/10 (Sam W's white paper);
> > > 2. Following schematics in ExpandedLog.sch file:
> > > a. Log Detector, Rev 1.1, 3/15/10, and
> > > b. VGA, Rev 1.1, 9/10/10; and
> > > 3.Log Detect PCB SEW Mod 3/15/10.
> > >
> > > I could not reconcile the following aspects of Fdbk interface from Log Det to VGA.
> > >
> > > A. The R/C values at Log Det MagVolts source is 220 ohm/0.01 uF (2b note) vs 2.7 kohms/0.001 uF (2a - R7/C13).
> > >
> > > B Log Det R6 value is 75 ohms (3 note) vs 100 ohm (1) on page 5.
> > >

> > > C. VGA R2 value is 3.0 kohms (2b) vs short (1) on page 8.
> > >
> > > In the Expanded Log Amp configuration, since the MagVolts source for ADC is VGA rather than Log Det, can the J2 Log Det connector be used as the source for VGA Fdbk input rather than Log Det J2A?
> > >
> > > Larry, W2HHV
> > >
> >
>

8018. Re: I have built some modules which is easier and inexpensive

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-26 01:35:56 UTC
From: taishan_ma
Topic: 7586 Message: 8018

--- In spectrumanalyzer@yahoogroups.com, "taishan_ma" <taishan_ma@...> wrote:
>
>
>
> --- In spectrumanalyzer@yahoogroups.com, "taishan_ma" <taishan_ma@> wrote:
> >
> > hello,
> >
> > I have built some modules which is easier and inexpensive. Hopefully it can work well.
http://www.qsl.net/bg6khc/
> >
> > bg6khc
> >
>
> you can reach it at:
>
> http://cgi.ebay.com/s53mv-type-2-3G-VCO-PLL-4113-AD4116-PCB-/220774793402?pt=LH_DefaultD
omain_0&hash=item33673400ba#ht_500wt_1156
>
> thanks!
>
> bg6khc
>

I really have built many PCB boards, if you need it, please check my eBay selling items.
This is the first time that I try to sell some items on eBay.

Thanks.

following are the boards which I can provided.

1) VCO_2G_3G board U$8. fully tested.
2) VCO_2G board U$6. fully tested.
3) ADF4350 board U$6. partial tested.
4) ADF4350 or VCO control board U$8. partial tested.
5) adl5513 PCB board U$6. fully tested.
6) dds_107 PCB board U$8. fully tested.
7) MO_64 board U$6. fully tested.
8) PDM board U$6. not tested.
9) AMP_ALC board U$6. not tested.
10) Attenu board U$6. not tested.

8019. Re: I have built some modules which is easier and inexpensive

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-26 01:39:39 UTC
From: taishan_ma
Topic: 7586 Message: 8019

```
> following are the boards which I can provided.
>
> 1) VCO_2G_3G board U$8. fully tested.
> 2) VCO_2G board U$6. fully tested.
> 3) ADF4350 board U$6. partial tested.
> 4) ADF4350 or VCO control board U$8. partial tested.
> 5) adl5513 PCB board U$6. fully tested.
> 6) dds_107 PCB board U$8. fully tested.
> 7) MO_64 board U$6. fully tested.
> 8) PDM board U$6. not tested.
> 9) AMP_ALC board U$6. not tested.
> 10) Attenu board U$6. not tested.
>
```

For details, please check files which I have been uploaded.

bg6khc_board.zip

thanks.

8020. Express Miniboards

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-28 18:16:26 UTC
From: william
Topic: 8020 Message: 8020

Hi All,
It has just come to my attention that Express PCB has another option to their Miniboard service. It is called MiniBoardPro. It is the same service as their Standard Miniboard, but provides silkscreen and soldermask layers.
The reason I bring this up is that my board designs have been developed with only the Standard Miniboard in mind. If you order my designs using MiniBoardPro, ground layers will likely be covered in soldermask. Electrically, this is not a problem. However, when you attach some components and fences, you will have to scrape away the soldermask for soldering. I just wanted to warn you before you start to curse me.
Express's new MiniBoardPro service is great, but my PWB designs will need modification to fully utilize their benefits.
Scotty

8021. Re: Express Miniboards

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-28 19:26:02 UTC
From: Sam
Topic: 8020 Message: 8021

The necessary modifications for solder mask aren't too bad, primarily involving putting 40 mil wide pads around the outside of the board (solder mask is automatically blocked on actual "pads" and "vias" but not on traces or filled planes) and blocking solder mask on the entire bottom. Pads also have to be placed wherever there would be internal fencing. Boards designed to have SMA connectors slide on the side of the board (this doesn't include any of the standard SLIMs) also need mask blocked for their center pins and legs.

The biggest problem has to do with silk-screened text. You usually have to move the text outside the component boundary (it won't print on bare pads, and you don't want it there anyway) and there is usually very little room to put it, since ExpressPCB's minimum font size is fairly large. You will end up simply "hiding" about half of the component labels, which eliminates much of the advantage of silk-screening.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "william" <wsprowls@...> wrote:
>
> Hi All,
> It has just come to my attention that Express PCB has another option to their Miniboard service. It is called MiniBoardPro. It is the same service as their Standard Miniboard, but provides silkscreen and soldermask layers.
> The reason I bring this up is that my board designs have been developed with only the Standard Miniboard in mind. If you order my designs using MiniBoardPro, ground layers will likely be covered in soldermask. Electrically, this is not a problem. However, when you attach some components and fences, you will have to scrape away the soldermask for soldering. I just wanted to warn you before you start to curse me.
> Express's new MiniBoardPro service is great, but my PWB designs will need modification to fully utilize their benefits.
> Scotty
>

8022. Which coax to use ?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-29 01:08:09 UTC
From: jjkirb1
Topic: 8022 Message: 8022

Hi, can any one direct me to web page which talks about, which type of coax to use to connect up the SLIM's for Scotties MSA ETc.. It looks like in the pictures that couple of the cables are UT 141 rigid coax. Any help would be apreciated.

8023. Re: Which coax to use ?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-29 01:40:44 UTC
From: Sam
Topic: 8022 Message: 8023

The rigid/semi-rigid/semi-flexible terminology is ambiguous. I go with the terminology copper-tube-shield and conformable (which is the tin-dipped shield). (There is also aluminum-tube-shield and silver-plated-copper-tube shield, which I lump with copper-tube-shield.) The basic size choices are 0.141 inch and 0.86 inch (sometimes called 0.85 inch). They are all good, but the ideal is probably to use copper-tube 0.141 for the PLO connections (>1 GHz) for low loss and absolute max shielding, and conformable 0.85/86 for <1 GHz, for the flexibility. For the cavity filter connections, some form of 0.141 is probably best. If you could be sure you wouldn't have to bend and re-bend it, the copper-tube would be best; otherwise the conformable is best.

Conformable is flexible and can be re-bent several times, but beware of twisting it. That is, if you have it bent at 90 degrees parallel to the bench, and want it 90 degrees toward the bench, don't twist it; rather, you should straighten it and re-bend it.

For the 10.7 MHz connections, you can even go with plastic jacketed non-dipped coax, but be sure it is double shielded (typically, a braided shield plus an aluminum foil wrap).

In my MSA, I use the conformable coax everywhere, and it works well. But if I did it again I would use the copper tube stuff for the PLOs, just to be safe.

Some people call the copper-tube-shielded coax "semi-rigid". If that is semi-rigid, I would like to see what "rigid" is--perhaps something encased in a 1/2" plumbing pipe.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "jjkirb1" <sjkirby@...> wrote:
>
> Hi, can any one direct me to web page which talks about, which type of coax to use to connect up the SLIM's for Scotties MSA ETc.. It looks like in the pictures that couple of the cables are UT 141 rigid coax. Any help would be apreciated.
>

8024. Re: [spectrumanalyzer] Re: Which coax to use ?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-29 03:57:16 UTC
From: william sprowls
Topic: 8022 Message: 8024

Hi Sam,
 In my day (long ago) "rigid" meant hard waveguide. But, you are right. The terminologies today are very ambiguous.
 I would advise against the silver plated aluminum semi-rigid unless you are very good at soldering. You get one shot at this stuff. With too much heat, the silver will leach and leave the bare alu. Then, it won't solder again.
Scotty

--- On Thu, 4/28/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@comcast.net>
Subject: [spectrumanalyzer] Re: Which coax to use ?
To: spectrumanalyzer@yahoogroups.com
Date: Thursday, April 28, 2011, 8:40 PM

The rigid/semi-rigid/semi-flexible terminology is ambiguous. I go with the terminology copper-tube-shield and conformable (which is the tin-dipped shield). (There is also aluminum-tube-shield and silver-plated-copper-tube shield, which I lump with copper-tube-shield.) The basic size choices are 0.141 inch and 0.86 inch (sometimes called 0.85 inch). They are all good, but the ideal is probably to use copper-tube 0.141 for the PLO connections (>1 GHz) for low loss and absolute max shielding, and conformable 0.85/86 for <1 GHz, for the flexibility. For the cavity filter connections, some form of 0.141 is probably best. If you could be sure you wouldn't have to bend and re-bend it, the copper-tube would be best; otherwise the conformable is best.

Conformable is flexible and can be re-bent several times, but beware of twisting it. That is, if you have it bent at 90 degrees parallel to the bench, and want it 90 degrees toward the bench, don't twist it; rather, you should straighten it and re-bend it.

For the 10.7 MHz connections, you can even go with plastic jacketed non-dipped coax, but be sure it is double shielded (typically, a braided shield plus an aluminum foil wrap).

In my MSA, I use the conformable coax everywhere, and it works well. But if I did it again I would use the copper tube stuff for the PLOs, just to be safe.

Some people call the copper-tube-shielded coax "semi-rigid". If that is semi-rigid, I would like to see what "rigid" is--perhaps something encased in a 1/2" plumbing pipe.

Sam W.

8025. Re: Which coax to use ?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-29 16:01:40 UTC
From: jjkirb1
Topic: 8022 Message: 8025

Thank you that helps alot.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> The rigid/semi-rigid/semi-flexible terminology is ambiguous. I go with the terminology copper-tube-shield and conformable (which is the tin-dipped shield). (There is also aluminum-tube-shield and silver-plated-copper-tube shield, which I lump with copper-tube-shield.) The basic size choices are 0.141 inch and 0.86 inch (sometimes called 0.85 inch). They are all good, but the ideal is probably to use copper-tube 0.141 for the PLO connections (>1 GHz) for low loss and absolute max shielding, and conformable 0.85/86 for <1 GHz, for the flexibility. For the cavity filter connections, some form of 0.141 is probably best. If you could be sure you wouldn't have to bend and re-bend it, the copper-tube would be best; otherwise the conformable is best.
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>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "jjkirb1" <sjkirby@> wrote:
> >
> > Hi, can any one direct me to web page which talks about, which type of coax to use to connect up the SLIM's for Scotties MSA ETc.. It looks like in the pictures that couple of the cables are UT 141 rigid coax. Any help would be apreciated.
> >
>

8026. Low Z Measurement; Dip Meter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-29 16:11:49 UTC
From: Sam
Topic: 8026 Message: 8026

I put together some documentation on the fixture I used to measure RF wire resistance. It is optimized for the range 0.01-10 ohms, though it will measure higher impedances:

<http://www.wetterlin.org/sam/SA/Operation/Fixture_LoZ.pdf>

With a slight modification to add a coupling coil, this fixture can be used as a dip meter to find resonant frequencies:

<http://www.wetterlin.org/sam/SA/Operation/Fixture_DipMeter.pdf>

Sam W.

8027. Where Used for Female Contacts

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-30 16:02:04 UTC
From: lh1907
Topic: 8027 Message: 8027

I am starting to build the MSA modules using the parts from Cash Olsen's Discrete and IC Group Buy of Spring 2009. Would someone describe where the contacts (items 68 and 69 on Cash's parts list) are used?

#68 Qty 125, Conn Term Female 22-24AWG Gold (90123-0112); and
#69 Qty 24, Conn Socket 22-24AWG .100" Gold (90119-2110).

The Molex P/N is in parenthesis. The specs on Mouser and Molex sites provided no basis for deciding which contact is used on which 0.025 SQ Conn Header position. Both contacts are gold plated but prices are significantly different: Per 100 costs are $6.70 (#68) vs $21.00 (#69).

#68 part is rated for 250v at 3 amp. Found not electrical spec for #69 contact.

Adding up the total number of conn housing positions (127), it appears Cash has include some spare of each type contact for build breakage.

Larry, W2HHV

8028. Re: Where Used for Female Contacts

Yahoo group: spectrumanalyzer (2011)
Date: 2011-04-30 19:29:54 UTC
From: Sam
Topic: 8027 Message: 8028

On Digi-Key, the 0112 part is the plastic housing for the contacts, and the 2110 parts are the actual connectors that crimp to the wires and fit inside the housing. Both are the Molex C-Grid III series. None of the header pins carry enough current that current capacity would be a concern. I used the C-Grid III connectors everywhere.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@...> wrote:
>
> I am starting to build the MSA modules using the parts from Cash Olsen's Discrete and IC Group Buy of Spring 2009. Would someone describe where the contacts (items 68 and 69 on Cash's parts list) are used?
>
> #68 Qty 125, Conn Term Female 22-24AWG Gold (90123-0112); and
> #69 Qty 24, Conn Socket 22-24AWG .100" Gold (90119-2110).
>
> The Molex P/N is in parenthesis. The specs on Mouser and Molex sites provided no basis for deciding which contact is used on which 0.025 SQ Conn Header position. Both contacts are gold plated but prices are significantly different: Per 100 costs are $6.70 (#68) vs $21.00 (#69).
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> #68 part is rated for 250v at 3 amp. Found not electrical spec for #69 contact.
>
> Adding up the total number of conn housing positions (127), it appears Cash has include some spare of each type contact for build breakage.
>
> Larry, W2HHV
>

8029. Re: Where Used for Female Contacts

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-01 11:23:14 UTC
From: lh1907
Topic: 8027 Message: 8029

Sorry for the typo. The correct P/N for item 68 part is:

#68 Qty 125, Conn Term Female 22-24AWG Gold (16-02-0087).

Corrected P/N in original e-mail of this message.

No obvious difference between two parts except internal two wiper blades are on opposite sides (relative to open side of U for wire crimp). Item 68 contacts are on a bandoleer (25 contacts per strip, 5 strips total). Item 69 contacts are in a plastic bag; loose single contacts.

Not very objective, but unless someone has more insight, I'll use the item 68 part everywhere. i.e., Based on total qty.

Larry, W2HHV

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> On Digi-Key, the 0112 part is the plastic housing for the contacts, and the 2110 parts are the actual connectors that crimp to the wires and fit inside the housing. Both are the Molex C-Grid III series. None of the header pins carry enough current that current capacity would be a concern. I used the C-Grid III connectors everywhere.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@> wrote:
> >
> > I am starting to build the MSA modules using the parts from Cash Olsen's Discrete and IC Group Buy of Spring 2009. Would someone describe where the contacts (items 68 and 69 on Cash's parts list) are used?
> >
> > #68 Qty 125, Conn Term Female 22-24AWG Gold (16-02-0087); and
> > #69 Qty 24, Conn Socket 22-24AWG .100" Gold (90119-2110).
> >
> > The Molex P/N is in parenthesis. The specs on Mouser and Molex sites provided no basis for deciding which contact is used on which 0.025 SQ Conn Header position. Both contacts are gold plated but prices are significantly different: Per 100 costs are $6.70 (#68) vs $21.00 (#69).
> >
> > #68 part is rated for 250v at 3 amp. Found not electrical spec for #69 contact.
> >
> > Adding up the total number of conn housing positions (127), it appears Cash has include some spare of each type contact for build breakage.
> >
> > Larry, W2HHV
> >

>

8030. Re: Where Used for Female Contacts

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-01 13:21:32 UTC
From: Sam
Topic: 8027 Message: 8030

The #68 parts are C-Grid, vs C-Grid-III for the #69 parts. I think I remember seeing something in the Digi-Key description to the effect that C-Grid parts don't mate with C-Grid-III parts. Since I couldn't see any difference I decided I was just going to pick one series and stick with that. So that's what I did until I ran out of the headers and housings, at which point I used C-Grid-III connectors in some housings I had gotten from Jameco, with header pins I also got from Jameco. With the wires crimped into the connectors, I could not slide the connectors quite far enough into the housing to lock in place. When plugged onto the header, it made a very tight connection, which seemed good until I realized one of the connectors had been pushed partially out the back of the housing. I got that back into place and everything is fine.

The moral is that these parts don't seem to be as standardized as one would expect.

Dealing with connectors is always the worst part of any electronics project.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@...> wrote:
>
> Sorry for the typo. The correct P/N for item 68 part is:
>
> #68 Qty 125, Conn Term Female 22-24AWG Gold (16-02-0087).
>
> Corrected P/N in original e-mail of this message.
>
> No obvious difference between two parts except internal two wiper blades are on opposite sides (relative to open side of U for wire crimp). Item 68 contacts are on a bandoleer (25 contacts per strip, 5 strips total). Item 69 contacts are in a plastic bag; loose single contacts.
>
> Not very objective, but unless someone has more insight, I'll use the item 68 part everywhere. i.e., Based on total qty.
>
> Larry, W2HHV
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > On Digi-Key, the 0112 part is the plastic housing for the contacts, and the 2110 parts are the actual connectors that crimp to the wires and fit inside the housing. Both are the Molex C-Grid III series. None of the header pins carry enough current that current capacity would be a concern. I used the C-Grid III connectors everywhere.
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> > > Adding up the total number of conn housing positions (127), it appears Cash has include some spare of each type contact for build breakage.
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> > > Larry, W2HHV
> > >
> >
>

8031. Re: Where Used for Female Contacts

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-02 17:18:17 UTC
From: lh1907
Topic: 8027 Message: 8031

Thanks for the insight Sam. I'll try a "mating" test case before using the C-Grid contact (item 68 part) and the qty on hand should cover the total MSA build. If the C-Grid contact (item 68 part) fails the mate test, I'll confirm the C-Grid-III contact (item #69 part) has no mating problems before using it on end item MSA Modules and ordering more contacts.

Larry, W2HHV

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> The #68 parts are C-Grid, vs C-Grid-III for the #69 parts. I think I remember seeing something in the Digi-Key description to the effect that C-Grid parts don't mate with C-Grid-III parts. Since I couldn't see any difference I decided I was just going to pick one series and stick with that. So that's what I did until I ran out of the headers and housings, at which point I used C-Grid-III connectors in some housings I had gotten from Jameco, with header pins I also got from Jameco. With the wires crimped into the connectors, I could not slide the connectors quite far enough into the housing to lock in place. When plugged onto the header, it made a very tight connection, which seemed good until I realized one of the connectors had been pushed partially out the back of the housing. I got that back into place and everything is fine.
>
> The moral is that these parts don't seem to be as standardized as one would expect.
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> Dealing with connectors is always the worst part of any electronics project.
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> > > > Larry, W2HHV
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>

8032. How to compare two curve with SA+TG mode or VNA mode

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-04 01:42:43 UTC
From: inlinebeginner
Topic: 8032 Message: 8032

Sam
The comercial VNA can compare two curves by displaying both memory&data (first data->memory), can we do similar work on MSA? The comparison function is very useful when tune circuit. Before change the part, a curve can be scanned and saved to memory, after the part is changed, we can see the difference between the memory and current scan.
Thanks
Lin

8033. Some extra PCBs on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-04 11:28:07 UTC
From: taishan_ma
Topic: 8033 Message: 8033

hello,

I have done some PCBs based on s53mv's projects and scotty's projects, and have put some extra PCBs on eBay. Maybe there have some of them that you needed.

Please let me know if you need any of them. You can also visit my poor website: http://www.qsl.net/bg6khc/.

Tnx and 73!

BG6KHC

8034. Re: Some extra PCBs on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-04 11:35:49 UTC
From: taishan_ma
Topic: 8033 Message: 8034

You can reach them at:
http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=220778955579&ssPageName=STRK:MESELX:IT#ht_483wt_1158

There about 12 types PCBs that I have put on eBay, actually I have also some other type's PCBs developed. However, I am limited put more items on eBay as a beginner.

Tnx and 73!

BG6KHC

8035. Re: How to compare two curve with SA+TG mode or VNA mode

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-04 13:45:16 UTC
From: Sam
Topic: 8032 Message: 8035

Lin,
Halt after you have the reference scan and use menu Options->Reference Lines, which lets you create reference lines in various ways. You want to create one by saving the current data. In addition, you can choose to simply display the line (which you probably want) or to add/subtract the line to/from future scan data. The line will be displayed, but you can't put markers on it. If you put markers on the main graph, as I recall the value of the reference line at the currently active marker will be displayed below the graph.

Menu Options->Appearances lets you customize the color of reference lines, just as you can for the regular graph lines.

If you elect to subtract the reference data from future scan data, you effectively can achieve calibration in SA+TG mode, with the reference scan being the calibration data. This subtraction is exactly what is done in Transmission mode to apply calibration. But if you do this in SA+TG mode, you will have "used up" the reference line feature for calibration, and can't do any additional reference lines. So if you want calibration and reference lines you should use Transmission mode.

At one point I was going to create a Snapshot feature to save a graph image in a new window for comparison with subsequent scans. But I decided it is just as easy to use a separate graphics program. In particular, I use the freeware screen capture program Greenshot. When you hit the Print Screen button, Greenshot lets you select the area of the screen to copy and then copies that to a new window where it can be used for visual comparison, or saved to a file. It will also let you add text, lines, arrows and highlighting. Of course, this graphics approach does not let you actually overlay two scans on the same graph, as you can with Reference Lines.

A diversion: SA+TG mode accomplishes nothing that Transmission mode can't do, and exists only for those who are more comfortable thinking of the MSA as a spectrum analyzer than as a network analyser. If your build does not include the PDM, VNA Transmission mode still operates, but without phase, and becomes a scalar network analyzer (SNA). At one point, I actually labeled it SNA when the PDM was not present, and did not even have SA+TG mode. A scalar network analyzer is really SA+TG with calibration. However, actual devices sold in the past as SNAs were apparently clunky instruments that pre-dated full VNAs, and the term has bad connotations.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> The comercial VNA can compare two curves by displaying both memory&data (first data->memory), can we do similar work on MSA? The comparison function is very useful when tune circuit. Before change the part, a curve can be scanned and saved to memory, after the part is changed, we can see the difference between the memory and current scan.
> Thanks

> Lin
>

8036. Re: How to compare two curve with SA+TG mode or VNA mode

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-07 21:25:15 UTC
From: inlinebeginner
Topic: 8032 Message: 8036

Same
Here is what I did in SA+TG mode:
1) Halt at end, Options>> reference lines
2) Choose "USE Current Data", "Data and Ref", and "Do trace for Right Axis">> OK
3) Change my circuit, and click Continue
I see two lines on my screen. One is the reference line, other one is the current scan.

Thanks.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
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> Lin,
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> > Thanks
> > Lin
> >
>

8037. Re: How to compare two curve with SA+TG mode or VNA mode

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-07 22:57:20 UTC
From: Sam
Topic: 8032 Message: 8037

Excellent!
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Same
> Here is what I did in SA+TG mode:
> 1) Halt at end, Options>> reference lines
> 2) Choose "USE Current Data", "Data and Ref", and "Do trace for Right Axis">> OK
> 3) Change my circuit, and click Continue
> I see two lines on my screen. One is the reference line, other one is the current scan.
>
> Thanks.
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > Lin,
> > Halt after you have the reference scan and use menu Options->Reference Lines, which lets you create reference lines in various ways. You want to create one by saving the current data. In addition, you can choose to simply display the line (which you probably want) or to add/subtract the line to/from future scan data. The line will be displayed, but you can't put markers on it. If you put markers on the main graph, as I recall the value of the reference line at the currently active marker will be displayed below the graph.
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> > > Thanks
> > > Lin
> > >
> >
>

8038. Marker Interpolation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-08 16:01:03 UTC
From: Sam
Topic: 8038 Message: 8038

In VNA modes, it is often handy to place markers between actual data points, as you would do to find where phase crosses zero if there is no actual data point actually at zero phase. In that case, the software interpolates the data from the neighboring data points. There are some interesting issues that arise, discussed here:

<http://www.wetterlin.org/sam/SA/Operation/MarkerInterpolation.pdf>

That document also illustrates some useful techniques with the MSA, such as MouseOver on the Smith chart, and the use of phase graphs with a range greater than 360 degrees.

Sam W.

8039. OSL

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-08 20:19:51 UTC
From: Sam
Topic: 8039 Message: 8039

I have updated the info on my web site regarding construction and characterization of calibration standards. There are several documents, with some overlap, combined in a zip file:

<http://www.wetterlin.org/sam/SA/Operation/CalStandards.zip>

Version 116 of the software contains a new method for describing cal standards, which is a little more flexible. Generally, though, I have gotten good results treating the calibration standards as being ideal.

Some time ago, we tested some standards made from Amphenol RFX connectors, and others made from certain Molex connectors. The characteristics of the Open and Short determined in those tests could be used by others using the same connectors. The characterisics of the Loads probably vary enough from build to build that a standard description is not suitable, but if you have a way to measure your Load on a commercial VNA these documents will help convert that data into a suitable description.

Sam W.

8040. Re: Add a 10.7 MHz band stop filter or HPF between PLO2 and Mixer 2?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-09 02:04:56 UTC
From: inlinebeginner
Topic: 7235 Message: 8040

Scotty
I added the RFA-1 buffer AMP between Mixer3-J3 and PLO2-J3, it does not help to reduce this spurs. However, after I added one more buffer AMP between PLO1-J2 and Mixer4-J1, this spurs is removed (it was -90dBm, now it is under -108dBm, I could not see). I tried, it needs two buffer AMPs, i.e, the leakage goes through two pathes.
The 10.111MHz spur of the 1kHz RBW path is also removed with above buffer Amps.
Lin
--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Lin and All,
> Â The 10.7 MHz spur seen during SA with TG Mode or during VNA Mode is created by the combination of PLO 3 and PLO 2. (I call it the I.F. spur because it will occur at the same frequency as the Final I.F, no matter what it is). When the selected sweep frequency point is 10.7 MHz, the PLO 3 is at 1034.7 MHz. This PLO 3 signal passes through Mixer 3 to PLO 2-J3. It then gets coupled to PLO 2-J2. The two signals, PLO 3 and PLO 2 are input to Mixer 2-J1. The mixing action of Mixer 2 creates the difference frequency of 10.7 MHz (1034.7-1024). Therefore, a low pass filter will not help. Besides, the buffer amplifiers inside PLO 2 are already low pass filters.
> Â The only way to decrease this spur is to decrease the amount of PLO 3 power getting all the way to Mixer 2. A very high isolation mixer at Mixer 3 could cure this spur, but I have not looked for a mixer that would make a good candidate for replacement. (the isolation from Lport to Rport should be at least 45 dB). Another fix is to add a buffer amplifier between PLO 2 and Mixer 3, that has a reverse isolation of 20 dB or better.
> Â One other note: I did some extensive modifications of Mixer 2 to better match 50 ohms. There was an improvement in this spur, but it was not significant enough to include any changes to the Mixer 2 design.
> Â This is one of those spurs that a user can "live with" if he knows exactly why it is there.
> Scotty
>
> --- On Sat, 12/11/10, inlinebeginner <inlinebeginner@...> wrote:
>
> From: inlinebeginner <inlinebeginner@...>
> Subject: [spectrumanalyzer] Add a 10.7 MHz band stop filter or HPF between PLO2 and Mixer 2?
> To: spectrumanalyzer@yahoogroups.com
> Date: Saturday, December 11, 2010, 12:09 AM
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> Scotty
>
> When working in TG mode, if we scan 10.7MHz, there is a -87dBm hump (someone mentioned this several months ago), you recommendation was switching to another filter 10.111MHz to do test. My MSA has both 10.7 and 10.111 MHz filter, therefore it is not a problem for me currently. But I still tried to see what causes that.
>
> Looks like PLO2 leakage is the major reason. If I disconnect the coax between PLO2 and Mix 2, this hump is gone completely (nothing happend if cavity filter is disconnected).
>
> As PLO is alway provides 1024MHz to mixer 2 (and mixer3) (Correct me if I am wrong), can we put a 10.7MHz band stop filter (BW 2MHz) or just a 500MHz HPF between PLO2 and Mixer 2? That may fix this problem. It may need about 40dB rejection at 10.7MHz.
>
> The PLO2 RFA has a 2.5dB PI attenuator at output, maybe we can use that to create a HPF, The insertion loss may be 2.5dB. On my board, I did not use this 2.5dB attenuator.
>
> Between mixer3 and PLO2, we may also add such a filter. Here is what I tried: If I disconnect the coax between PLO2 and mixer 3, the hump will drop from -87dBm to -100dBm, but still has something there. I guess that is from the mixer 4, or coupled from power supply.
>
>
>
> The advantage is that if we use Sam's expended log detector, it is easier to build the noise filter if we use same center frequency RBW filters.
>
>
>
> Lin
>

8041. Re: Add a 10.7 MHz band stop filter or HPF between PLO2 and Mixer 2?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-09 02:27:30 UTC
From: inlinebeginner
Topic: 7235 Message: 8041

Scotty and Sam
Looks like these two leakages randomly cancel each other, that is why we saw the spur amplitude is up and down, if we put only one isolation buffer amp in, the spur stops jumping and the scan curve becomes clear and stable. Does this mean if we put two buffer amplifiers it will help for the phase accuracy? Or is it helpful for lower signal phase detection?
Lin
--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Scotty
> I added the RFA-1 buffer AMP between Mixer3-J3 and PLO2-J3, it does not help to reduce this spurs. However, after I added one more buffer AMP between PLO1-J2 and Mixer4-J1, this spurs is removed (it was -90dBm, now it is under -108dBm, I could not see). I tried, it needs two buffer AMPs, i.e, the leakage goes through two pathes.
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> >
> > From: inlinebeginner <inlinebeginner@>
> > Subject: [spectrumanalyzer] Add a 10.7 MHz band stop filter or HPF between PLO2 and Mixer 2?
> > To: spectrumanalyzer@yahoogroups.com

> > Date: Saturday, December 11, 2010, 12:09 AM
> >
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> > Scotty
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> > Lin
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8042. lot of slim PCB boards on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-09 09:30:34 UTC
From: taishan_ma
Topic: 8042 Message: 8042

Hi all,

lot of slim PCB boards have been put on eBay.

refer: http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=220781413022&ssPageName=STRK:MESELX:IT#ht_500wt_1156

or visit: http://www.qsl.net/bg6khc/my_version.htm

Tnx and 73!
BG6KHC

8043. Re: Add a 10.7 MHz band stop filter or HPF between PLO2 and Mixer 2?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-09 13:07:07 UTC
From: Sam
Topic: 7235 Message: 8043

The isolation amp between PLO2 and Mixer 3 reduces the level of the "zero response", but in my MSA, as apparently in yours, it did not affect the 10.7 MHz spur. My internally generated spur at that frequency is fairly low, about -105 dBm. However, if you are running the TG signal through a DUT to the MSA input, there is an additional spur at 10.7 MHz that is caused by LO2 or LO3 (I forget which) in the TG signal. So if you are looking for internally generated spurs, you want to have terminations on the TG output and MSA input.

It sounds like you have tracked the remaining spur to leakage from Mixer 4 back to PLO1. Perhaps your Mixer 4 is especially leaky for some reason. If your buffer amp eliminates the spur, go with it.

This "10.7 MHz" spur actually occurs at whatever your RBW frequency is specified as. It is certainly possible that it comes from more than one source, as you say. This spur definitely affects phase accuracy if you are at exactly 10.7 MHz, if your actual test signal is within 40 or 50 dB of the spur level. But it doesn't affect phase accuracy at any frequency outside the approximate range of 10.7 MHz +/- the RBW bandwidth.

A simple test for the phase effect is to do a zero-width scan at the RBW frequency in Transmission mode, but with the MSA input coming from an external signal generator. Use the Narrow video filter. Start with a signal near -100 dBm, and watch the phase graph. If it is a wavy line, the spur is having an effect. Making the signal stronger will reduce the waviness. Adjusting the wait time affects the period of the waves. I believe the waviness comes primarily from the gradual phase change caused by the fact that the signal generator frequency is (almost certainly) slightly different from the MSA frequency. If they are too different, you'll probably get a mess. If they happen to be identical, this test may not show anything. I think mine are within a couple Hz of each other.

The above test can identify a spur even if it is well below your minimum visible signal.

The spur at 10.7 MHz might seem like a problem because a lot of work is done in that area. However, if you are scanning a 10.7 MHz filter, the filter output will be strong and the spur will have no effect. If you scanned a 10.6 MHz filter, you might see the spur as a blip on the base of the response; it would show up as a blip in the phase graph too, but you normally don't care about phase outside the pass band.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Scotty and Sam
> Looks like these two leakages randomly cancel each other, that is why we saw the spur amplitude is up and down, if we put only one isolation buffer amp in, the spur stops jumping and the scan curve becomes clear and stable. Does this mean if we put two buffer amplifiers it will help for the phase accuracy? Or is it helpful for lower signal phase detection?
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> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:

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> > Scotty
> > I added the RFA-1 buffer AMP between Mixer3-J3 and PLO2-J3, it does not help to reduce this spurs. However, after I added one more buffer AMP between PLO1-J2 and Mixer4-J1, this spurs is removed (it was -90dBm, now it is under -108dBm, I could not see). I tried, it needs two buffer AMPs, i.e, the leakage goes through two pathes.
> > The 10.111MHz spur of the 1kHz RBW path is also removed with above buffer Amps.
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> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
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> > > Hi Lin and All,
> > > Â The 10.7 MHz spur seen during SA with TG Mode or during VNA Mode is created by the combination of PLO 3 and PLO 2. (I call it the I.F. spur because it will occur at the same frequency as the Final I.F, no matter what it is). When the selected sweep frequency point is 10.7 MHz, the PLO 3 is at 1034.7 MHz. This PLO 3 signal passes through Mixer 3 to PLO 2-J3. It then gets coupled to PLO 2-J2. The two signals, PLO 3 and PLO 2 are input to Mixer 2-J1. The mixing action of Mixer 2 creates the difference frequency of 10.7 MHz (1034.7-1024). Therefore, a low pass filter will not help. Besides, the buffer amplifiers inside PLO 2 are already low pass filters.
> > > Â The only way to decrease this spur is to decrease the amount of PLO 3 power getting all the way to Mixer 2. A very high isolation mixer at Mixer 3 could cure this spur, but I have not looked for a mixer that would make a good candidate for replacement. (the isolation from Lport to Rport should be at least 45 dB). Another fix is to add a buffer amplifier between PLO 2 and Mixer 3, that has a reverse isolation of 20 dB or better.
> > > Â One other note: I did some extensive modifications of Mixer 2 to better match 50 ohms. There was an improvement in this spur, but it was not significant enough to include any changes to the Mixer 2 design.
> > > Â This is one of those spurs that a user can "live with" if he knows exactly why it is there.
> > > Scotty
> > >
> > > --- On Sat, 12/11/10, inlinebeginner <inlinebeginner@> wrote:
> > >
> > > From: inlinebeginner <inlinebeginner@>
> > > Subject: [spectrumanalyzer] Add a 10.7 MHz band stop filter or HPF between PLO2 and Mixer 2?
> > > To: spectrumanalyzer@yahoogroups.com
> > > Date: Saturday, December 11, 2010, 12:09 AM

> > >
> > >
> > > Scotty
> > >
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8044. Re: Add a 10.7 MHz band stop filter or HPF between PLO2 and Mixer 2?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-09 15:03:16 UTC
From: Sam
Topic: 7235 Message: 8044

Lin,
I just realized that you posted photos of the responses. Apparently the LO2 isolation amp did have some effect, but still left a large spur caused by the other leakage path. I haven't analyzed it thoroughly, but it seems odd that the two leakages combine to produce a spur that jumps around. That would indicate that they don't have a stable phase relationship and sometimes interfere constructively and sometimes destructively. I would have thought the phase relationship would be stable.

I mentioned the spur that arises at 10.7 MHz when the TG is connected to the MSA input. I believe that arises from LO3 and its harmonics in the TG. At 10.7 MHz, LO1=LO2=1024 MHz and LO3=1034.7 MHz. One of the Mixer 1 products will be 2xLO1-LO3, which is 1013.3 MHz, equal to the first IF.

The leakage path you describe lets LO3 leak through Mixer 4 into LO1. To the extent it works its way to the other LO1 connection of PLO1, it goes directly to Mixer 1, and creates exactly the same issue as LO3 in the TG. (Of course, LO3 in the TG can be eliminated with a low pass filter. Not so with LO3 in LO1.)

I suggest you inspect Mixer 4 and PLO1 to see if there is anything that might aggravate leakage, such as a bad solder joint on the mixer or connector pins sticking up in the air.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> The isolation amp between PLO2 and Mixer 3 reduces the level of the "zero response", but in my MSA, as apparently in yours, it did not affect the 10.7 MHz spur. My internally generated spur at that frequency is fairly low, about -105 dBm. However, if you are running the TG signal through a DUT to the MSA input, there is an additional spur at 10.7 MHz that is caused by LO2 or LO3 (I forget which) in the TG signal. So if you are looking for internally generated spurs, you want to have terminations on the TG output and MSA input.
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> This "10.7 MHz" spur actually occurs at whatever your RBW frequency is specified as. It is certainly possible that it comes from more than one source, as you say. This spur definitely affects phase accuracy if you are at exactly 10.7 MHz, if your actual test signal is within 40 or 50 dB of the spur level. But it doesn't affect phase accuracy at any frequency outside the approximate range of 10.7 MHz +/- the RBW bandwidth.
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> A simple test for the phase effect is to do a zero-width scan at the RBW frequency in Transmission mode, but with the MSA input coming from an external signal generator. Use the Narrow video filter. Start with a signal near -100 dBm, and watch the phase graph. If it is a wavy line, the spur is having an effect. Making the signal stronger will reduce the

waviness. Adjusting the wait time affects the period of the waves. I believe the waviness comes primarily from the gradual phase change caused by the fact that the signal generator frequency is (almost certainly) slightly different from the MSA frequency. If they are too different, you'll probably get a mess. If they happen to be identical, this test may not show anything. I think mine are within a couple Hz of each other.
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> > > > From: inlinebeginner <inlinebeginner@>
> > > > Subject: [spectrumanalyzer] Add a 10.7 MHz band stop filter or HPF between PLO2 and Mixer 2?
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8045. Re: [spectrumanalyzer] lot of slim PCB boards on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-10 03:40:41 UTC
From: william sprowls
Topic: 8042 Message: 8045

Hi All,
 I don't want to hurt anyone's feelings but I must make this comment. Any PWB that is not created from a released SLIM-PWB on the MSA web site is not truly, a SLIM. I'm not saying that other similar releases are not usable.
 I'll be more specific. If you take a released SLIM-PWB and have several made by Express, they are SLIMs. If you take a released SLIM-PWB and convert it to another CAD design for some other PWB house to manufacture, it will be a SLIM, but only if the conversion is 100% accurate. Any change to the pwb design negates its status as a "released SLIM".
Scotty

--- On Mon, 5/9/11, taishan_ma <taishan_ma@...> wrote:

From: taishan_ma <taishan_ma@...>
Subject: [spectrumanalyzer] lot of slim PCB boards on eBay
To: spectrumanalyzer@yahoogroups.com
Date: Monday, May 9, 2011, 4:30 AM

Hi all,

lot of slim PCB boards have been put on eBay.

refer: http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=220781413022&ssPageName=STRK:MESELX:IT#ht_500wt_1156

or visit: http://www.qsl.net/bg6khc/my_version.htm

Tnx and 73!

BG6KHC

8046. Re: lot of slim PCB boards on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-10 21:31:08 UTC
From: Sam
Topic: 8042 Message: 8046

It looks like a lot of work went into creating those eBay boards,
but there are a few things that make me wary. The PLO boards have the two outputs fairly close together, which may reduce the isolation. They also have the PLL reference clock connector located far from the PLL chip, increasing the odds of interference between the clock and the outputs. Likewise with the clock on the DDS; I recall that Scotty discovered that some spurs are reduced if you put the DDS clock input as close as possible to the pin, which means you can't use a connector with legs. The SMA connectors on the PLO and several other boards are very close to the edge, which might hamper fencing, and depending on your mounting arrangement might cause connectors on one board to be very close to those on another board. The bottom of the boards is not shown, but hopefully has no solder mask, to facilitate fencing and attachment of coax or connectors. Many of the boards have mounting holes, which you would likely have to cover up to use the normal mounting methods.

Several of the boards, like the mixers, probably need more top ground plane to preserve isolation. I'm not a big fan of putting ground pour everywhere, but in some places it is necessary. Where fencing is needed in the middle of the board, such as the DDS, the ground plane to which it solders should be free of solder mask.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
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> Scotty
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> --- On Mon, 5/9/11, taishan_ma <taishan_ma@...> wrote:
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> From: taishan_ma <taishan_ma@...>
> Subject: [spectrumanalyzer] lot of slim PCB boards on eBay
> To: spectrumanalyzer@yahoogroups.com
> Date: Monday, May 9, 2011, 4:30 AM
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> or visit: http://www.qsl.net/bg6khc/my_version.htm
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> Tnx and 73!
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> BG6KHC
>

8047. Re: [spectrumanalyzer] Re: lot of slim PCB boards on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-10 22:52:14 UTC
From: sjkirby@pacbell.net
Topic: 8042 Message: 8047

Hi. I have a question you might be able to help me with. I was thinking of adding IC sockets for U1-U4 for the control board do you think this give me any problems? I will be using gold contacts.
Any help would be apreciated, thanks in advance Stephen.
Sent via DROID on Verizon Wireless

-----Original message-----
From: Sam <swetterlin@comcast.net>
To: spectrumanalyzer@yahoogroups.com
Sent: Tue, May 10, 2011 21:31:08 GMT+00:00
Subject: [spectrumanalyzer] Re: lot of slim PCB boards on eBay

It looks like a lot of work went into creating those eBay boards,
but there are a few things that make me wary. The PLO boards have the two outputs fairly close together, which may reduce the isolation. They also have the PLL reference clock connector located far from the PLL chip, increasing the odds of interference between the clock and the outputs. Likewise with the clock on the DDS; I recall that Scotty discovered that some spurs are reduced if you put the DDS clock input as close as possible to the pin, which means you can't use a connector with legs. The SMA connectors on the PLO and several other boards are very close to the edge, which might hamper fencing, and depending on your mounting arrangement might cause connectors on one board to be very close to those on another board. The bottom of the boards is not shown, but hopefully has no solder mask, to facilitate fencing and attachment of coax or connectors. Many of the boards have mounting holes, which you would likely have to cover up to use the normal mounting methods.

Several of the boards, like the mixers, probably need more top ground plane to preserve isolation. I'm not a big fan of putting ground pour everywhere, but in some places it is necessary. Where fencing is needed in the middle of the board, such as the DDS, the ground plane to which it solders should be free of solder mask.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
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> Tnx and 73!
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> BG6KHC
>

8048. Re: [spectrumanalyzer] lot of slim PCB boards on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-10 23:02:09 UTC
From: William Dillon
Topic: 8042 Message: 8048

I personally encourage IC sockets.

It is trivial to zap those ICs, and it's nice to be able to replace them as simply as it is to destroy them :)

On May 10, 2011, at 3:52 PM, sjkirby@... wrote:

>
> Hi. I have a question you might be able to help me with. I was thinking of adding IC sockets for U1-U4 for the control board do you think this give me any problems? I will be using gold contacts.
> Any help would be apreciated, thanks in advance Stephen.
> Sent via DROID on Verizon Wireless
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> -----Original message-----
> From: Sam <swetterlin@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Tue, May 10, 2011 21:31:08 GMT+00:00
> Subject: [spectrumanalyzer] Re: lot of slim PCB boards on eBay
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> > Scotty
> >
> > --- On Mon, 5/9/11, taishan_ma <taishan_ma@...> wrote:
> >
> > From: taishan_ma <taishan_ma@...>
> > Subject: [spectrumanalyzer] lot of slim PCB boards on eBay
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Monday, May 9, 2011, 4:30 AM
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> > Hi all,
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> >
> > lot of slim PCB boards have been put on eBay.
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> >
> > refer: http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=220781413022&ssPageName=STRK:MESELX:IT#ht_500wt_1156
> >
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> >
> > or visit: http://www.qsl.net/bg6khc/my_version.htm
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> > Tnx and 73!
> >
> > BG6KHC
> >
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8049. Re: lot of slim PCB boards on eBay. NOT! Sockets for latch board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-10 23:48:05 UTC
From: Sam
Topic: 8042 Message: 8049

Absolutely. Several people have had problems zapping latches, and sockets would make it easier to replace ICs. I wouldn't use sockets on other boards, though.

Long ago, there was a discussion about not mixing tin and gold in the header connections--"fretting" causes tin oxide to end up embedded in the gold, unless you use an anti-oxidant lubricant. So you would actually best off with tin sockets.

By the way, it seems to be common practice to post a message by replying to a totally unrelated message. Bad idea.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> I personally encourage IC sockets.
>
> It is trivial to zap those ICs, and it's nice to be able to replace them as simply as it is to destroy them :)
>
> On May 10, 2011, at 3:52 PM, sjkirby@... wrote:
>
> >
> > Hi. I have a question you might be able to help me with. I was thinking of adding IC sockets for U1-U4 for the control board do you think this give me any problems? I will be using gold contacts.
> > Any help would be apreciated, thanks in advance Stephen.
> > Sent via DROID on Verizon Wireless
> >

8050. Re: Sockets for latch boards. ESD protection too

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-11 01:02:26 UTC
From: Greg Broburg
Topic: 8042 Message: 8050

There are chip transient overvoltage limiters are available.
I have used AVX series with excellent results.

Something like VC120605VC100 is a 1206 size part
designed for normal operation below 5V6 and clamp
value of 12V.

These need to have short leads to the protection line and
to the ground of the circuit to work right.

Greg

On 5/10/2011 5:48 PM, Sam wrote:
>
> Absolutely. Several people have had problems zapping latches, and
> sockets would make it easier to replace ICs. I wouldn't use sockets on
> other boards, though.
>
> Long ago, there was a discussion about not mixing tin and gold in the
> header connections--"fretting" causes tin oxide to end up embedded in
> the gold, unless you use an anti-oxidant lubricant. So you would
> actually best off with tin sockets.
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> By the way, it seems to be common practice to post a message by
> replying to a totally unrelated message. Bad idea.
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> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, William Dillon
> <hpux735@...> wrote:
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> > > Hi. I have a question you might be able to help me with. I was
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> > > Any help would be apreciated, thanks in advance Stephen.
> > > Sent via DROID on Verizon Wireless
> > >

>
>

8051. Re: [spectrumanalyzer] lot of slim PCB boards on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-11 01:32:55 UTC
From: sjkirby@pacbell.net
Topic: 8042 Message: 8051

Thank you I will give it a try.

Sent via DROID on Verizon Wireless

-----Original message-----
From: William Dillon <hpux735@gmail.com>
To: spectrumanalyzer@yahoogroups.com
Sent: Tue, May 10, 2011 23:02:09 GMT+00:00
Subject: Re: [spectrumanalyzer] lot of slim PCB boards on eBay

I personally encourage IC sockets.

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> Any help would be apreciated, thanks in advance Stephen.
> Sent via DROID on Verizon Wireless
>
>
> -----Original message-----
> From: Sam <swetterlin@comcast.net>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Tue, May 10, 2011 21:31:08 GMT+00:00
> Subject: [spectrumanalyzer] Re: lot of slim PCB boards on eBay
>
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>
> It looks like a lot of work went into creating those eBay boards,
> but there are a few things that make me wary. The PLO boards have the two outputs fairly close together, which may reduce the isolation. They also have the PLL reference clock connector located far from the PLL chip, increasing the odds of interference between the clock and the outputs. Likewise with the clock on the DDS; I recall that Scotty discovered that some spurs are reduced if you put the DDS clock input as close as possible to the pin, which means you can't use a connector with legs. The SMA connectors on the PLO and several other boards are very close to the edge, which might hamper fencing, and depending on your mounting arrangement might cause connectors on one board to be very close to those on another board. The bottom of the boards is not shown, but hopefully has no solder mask, to facilitate fencing and attachment of coax or connectors. Many of the boards have mounting holes, which you would likely have to cover up to use the normal mounting methods.
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> Several of the boards, like the mixers, probably need more top ground plane to preserve isolation. I'm not a big fan of putting ground pour everywhere, but in some places it is necessary. Where fencing is needed in the middle of the board, such as the DDS, the ground plane to which it solders should be free of solder mask.
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> Sam W.
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> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
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> > From: taishan_ma <taishan_ma@...>
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> > Tnx and 73!
> >
> > BG6KHC
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8052. Re: lot of slim PCB boards on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-11 05:22:01 UTC
From: taishan_ma
Topic: 8042 Message: 8052

Thanks for the comments.

I definitely not like rework on these boards (as is pointed out by scotty that errors may occur during this process). However, expressPCB's services are not available for me, also their's prices are really expensive.

I will test the performance of these boards in the following days, and the test results will be updated on my website.

Most of the modifications about these boards are specialized for a kind of enclosure (refer to: http://www.qsl.net/bg6khc/closure1.jpg, http://www.qsl.net/bg6khc/closure.jpg, http://www.qsl.net/bg6khc/closure2.jpg), which costs only U$2-3 for me.

thanks.
BG6KHC

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
>
> It looks like a lot of work went into creating those eBay boards,
> but there are a few things that make me wary. The PLO boards have the two outputs fairly close together, which may reduce the isolation. They also have the PLL reference clock connector located far from the PLL chip, increasing the odds of interference between the clock and the outputs. Likewise with the clock on the DDS; I recall that Scotty discovered that some spurs are reduced if you put the DDS clock input as close as possible to the pin, which means you can't use a connector with legs. The SMA connectors on the PLO and several other boards are very close to the edge, which might hamper fencing, and depending on your mounting arrangement might cause connectors on one board to be very close to those on another board. The bottom of the boards is not shown, but hopefully has no solder mask, to facilitate fencing and attachment of coax or connectors. Many of the boards have mounting holes, which you would likely have to cover up to use the normal mounting methods.
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> > Scotty
> >

8053. Re: lot of slim PCB boards on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-11 05:26:39 UTC
From: n6tdt
Topic: 8042 Message: 8053

The links to the pictures contains a comma after jpg.

I have corrected the links

http://www.qsl.net/bg6khc/closure.jpg

http://www.qsl.net/bg6khc/closure1.jpg

http://www.qsl.net/bg6khc/closure2.jpg

Nice looking enclosures..

Dan Ellis
N6TDT

--- In spectrumanalyzer@yahoogroups.com, "taishan_ma" <taishan_ma@...> wrote:
>
> Thanks for the comments.
>
> I definitely not like rework on these boards (as is pointed out by scotty that errors may occur during this process). However, expressPCB's services are not available for me, also their's prices are really expensive.
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> I will test the performance of these boards in the following days, and the test results will be updated on my website.
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>
> thanks.
> BG6KHC
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> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> >
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> > > Scotty
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8054. Re: [spectrumanalyzer] Re: lot of slim PCB boards on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-11 07:48:34 UTC
From: R Wall
Topic: 8042 Message: 8054

Hi Stephen,

My view on IC sockets is:
When IC sockets are added you are adding an extra mechanical connection. In theory mechanical devices are not as reliable as low voltage ICs. If you must use IC sockets as in computer mother boards for BIOS chips. Then I would use turned pin gas-less IC sockets. The IC is harder to push into the socket because the oxide coating is scraped off the IC pins. A gas-less connection is formed between the pin and socket and shouldn't oxide as air can't in get between the pin and socket. I would never use the cheap pressed tin sockets as they will oxide in no time. I've heard of stories where the Maintenance technician went around wiggling all the ICs in their sockets to get it working again.

My rule is: (1) Don't use sockets unless you have to. (2) If you must use sockets, then use only gas-less pin sockets.

Has anyone else had this experience?

Roderick Wall, vk3yc.

From: sjkirby@...
Sent: Wednesday, May 11, 2011 8:52 AM
To: spectrumanalyzer@yahoogroups.com
Subject: Re: [spectrumanalyzer] Re: lot of slim PCB boards on eBay

Hi. I have a question you might be able to help me with. I was thinking of adding IC sockets for U1-U4 for the control board do you think this give me any problems? I will be using gold contacts.
Any help would be apreciated, thanks in advance Stephen.
Sent via DROID on Verizon Wireless

-----Original message-----

From: Sam <swetterlin@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Tue, May 10, 2011 21:31:08 GMT+00:00
Subject: [spectrumanalyzer] Re: lot of slim PCB boards on eBay

It looks like a lot of work went into creating those eBay boards,
but there are a few things that make me wary. The PLO boards have the two outputs fairly close together, which may reduce the isolation. They also have the PLL reference clock connector located far from the PLL chip, increasing the odds of interference between the clock and the outputs. Likewise with the clock on the DDS; I recall that Scotty discovered that some spurs are reduced if you put the DDS clock input as close as possible to the pin, which means you can't use a connector with legs. The SMA connectors on the PLO and several other boards are very close to the edge, which might hamper fencing, and depending on your mounting arrangement might cause connectors on one board to be very close to those on another board. The bottom of the boards is not shown, but hopefully has no solder mask, to

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Sam W.

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No virus found in this message.
Checked by AVG - www.avg.com
Version: 10.0.1325 / Virus Database: 1500/3621 - Release Date: 05/06/11

8055. Re: [spectrumanalyzer] Re: lot of slim PCB boards on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-11 07:59:09 UTC
From: Jeff Blaine
Topic: 8042 Message: 8055

Rodrick,

This is all good. But on my bench, things are never that controlled.

In fact, about a month ago I managed to fry about 1/2 the 17 chip IC content of a board I built that has a bunch of Af related filtering functions on it. There was an LCD module on a bracket on the bottom of the unit and somehow a 1/4" jack that normally plugs into my rig worked its way through a very small opening and managed to touch just the right thing on the back of that LCD to cause the "fry event" to occur.

Maybe other guys are a lot more careful and lucky. But here, Mr. Murphy lays in wait – sometimes I feel he's on a personal mission to kill every home-brew gadget I've cooked up... Other guys may have better luck. The reliability issues associated with using sockets are really minimal compared to the damage I can do to a PCB pulling a IC off. And sockets can make it real easy if you are unsure which IC has failed (or been fried).

So a long time ago, after having lots of bad luck like this, I have made sockets part of my SOP for everything unless it's going to have an RF related impact. That is a very significant concern on the SSA, however.

Good luck!

73, Jeff ACØC
www.ac0c.com

From: R Wall
Sent: Wednesday, May 11, 2011 2:48 AM
To: spectrumanalyzer@...m
Subject: Re: [spectrumanalyzer] Re: lot of slim PCB boards on eBay

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No virus found in this message.
Checked by AVG - www.avg.com
Version: 10.0.1325 / Virus Database: 1500/3621 - Release Date: 05/06/11

8056. Re: [spectrumanalyzer] Re: lot of slim PCB boards on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-11 08:53:12 UTC
From: R Wall
Topic: 8042 Message: 8056

Hi Jeff,

As I've indicated these are my views on sockets. I would rather troubleshoot and unsolder 8 ICs than adding 17 sockets just in case I blow them up. And knowing that I have a more reliable finished product when finished. As I've indicated, if I ever use IC socket I use gas-less sockets.

Roderick Wall, vk3yc.

From: Jeff Blaine
Sent: Wednesday, May 11, 2011 5:59 PM
To: spectrumanalyzer@yahoogroups.com
Subject: Re: [spectrumanalyzer] Re: lot of slim PCB boards on eBay

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Subject: Re: [spectrumanalyzer] Re: lot of slim PCB boards on eBay

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My rule is: (1) Don't use sockets unless you have to. (2) If you must use sockets, then use only gas-less pin sockets.

Has anyone else had this experience?

Roderick Wall, vk3yc.

From: sjkirby@...
Sent: Wednesday, May 11, 2011 8:52 AM
To: spectrumanalyzer@yahoogroups.com
Subject: Re: [spectrumanalyzer] Re: lot of slim PCB boards on eBay

Hi. I have a question you might be able to help me with. I was thinking of adding IC sockets for U1-U4 for the control board do you think this give me any problems? I will be using gold contacts.
Any help would be apreciated, thanks in advance Stephen.
Sent via DROID on Verizon Wireless

-----Original message-----

From: Sam <swetterlin@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Tue, May 10, 2011 21:31:08 GMT+00:00
Subject: [spectrumanalyzer] Re: lot of slim PCB boards on eBay

It looks like a lot of work went into creating those eBay boards,
but there are a few things that make me wary. The PLO boards have the two outputs fairly close together, which may reduce the isolation. They also have the PLL reference clock connector located far from the PLL chip, increasing the odds of interference between the clock and the outputs. Likewise with the clock on the DDS; I recall that Scotty discovered that some spurs are reduced if you put the DDS clock input as close as possible to the pin, which means you can't use a connector with legs. The SMA connectors on the PLO and several other boards are very close to the edge, which might hamper fencing, and depending on your mounting arrangement might cause connectors on one board to be very close to those on another board. The bottom of the boards is not shown, but hopefully has no solder mask, to facilitate fencing and attachment of coax or connectors. Many of the boards have mounting holes, which you would likely have to cover up to use the normal mounting methods.

Several of the boards, like the mixers, probably need more top ground plane to preserve isolation. I'm not a big fan of putting ground pour everywhere, but in some places it is necessary. Where fencing is needed in the middle of the board, such as the DDS, the ground plane to which it solders should be free of solder mask.

Sam W.

--- In mailto:spectrumanalyzer%40yahoogroups.com, william sprowls <wsprowls@...> wrote:
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> Hi All,
> Â I don't want to hurt anyone's feelings but I must make this comment. Any PWB that is not created from a released SLIM-PWB on the MSA web site is not truly, a SLIM. I'm not saying that other similar releases are not usable.
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> --- On Mon, 5/9/11, taishan_ma <taishan_ma@...> wrote:
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> Subject: [spectrumanalyzer] lot of slim PCB boards on eBay
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>
> or visit: http://www.qsl.net/bg6khc/my_version.htm
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>
> Tnx and 73!
>
> BG6KHC
>

No virus found in this message.
Checked by AVG - www.avg.com
Version: 10.0.1325 / Virus Database: 1500/3621 - Release Date: 05/06/11

No virus found in this message.
Checked by AVG - www.avg.com
Version: 10.0.1375 / Virus Database: 1500/3629 - Release Date: 05/10/11

8057. Re: lot of slim PCB boards on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-11 13:43:25 UTC
From: Sam
Topic: 8042 Message: 8057

There certainly are reliability issues with sockets, though probably no more so than with the header pin connections. As there are only four latch ICs,it would be no great expense to use quality sockets, so if you use sockets you should certainly use good ones.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "R Wall" <maillist@...> wrote:
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> Hi Jeff,
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> As Iâ□□ve indicated these are my views on sockets. I would rather troubleshoot and unsolder 8 ICs than adding 17 sockets just in case I blow them up. And knowing that I have a more reliable finished product when finished. As Iâ□□ve indicated, if I ever use IC socket I use gas-less sockets.
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> Roderick Wall, vk3yc.
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> From: Jeff Blaine
> Sent: Wednesday, May 11, 2011 5:59 PM
> To: spectrumanalyzer@yahoogroups.com
> Subject: Re: [spectrumanalyzer] Re: lot of slim PCB boards on eBay
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> Rodrick,
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> This is all good. But on my bench, things are never that controlled.
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> In fact, about a month ago I managed to fry about 1/2 the 17 chip IC content of a board I built that has a bunch of Af related filtering functions on it. There was an LCD module on a bracket on the bottom of the unit and somehow a 1/4â□□ jack that normally plugs into my rig worked its way through a very small opening and managed to touch just the right thing on the back of that LCD to cause the â□□fry eventâ□□ to occur.
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> So a long time ago, after having lots of bad luck like this, I have made sockets part of my SOP for everything unless itâ□□s going to have an RF related impact. That is a very significant concern on the SSA, however.
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> Good luck!
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> 73, Jeff ACÃ□C
> www.ac0c.com
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> From: R Wall
> Sent: Wednesday, May 11, 2011 2:48 AM
> To: spectrumanalyzer@yahoogroups.com
> Subject: Re: [spectrumanalyzer] Re: lot of slim PCB boards on eBay
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> Hi Stephen,
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> Sent: Tue, May 10, 2011 21:31:08 GMT+00:00
> Subject: [spectrumanalyzer] Re: lot of slim PCB boards on eBay
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8058. Re: lot of slim PCB boards on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-11 14:52:45 UTC
From: ed_k7ock
Topic: 8042 Message: 8058

I used the IC sockets on my control board and have been glad I did since I have managed to zap a couple of the IC. I used the socket that recommended, or at least mentioned, on the forum several years ago.

Ed G

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
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> > Roderick Wall, vk3yc.
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> > From: Jeff Blaine
> > Sent: Wednesday, May 11, 2011 5:59 PM
> > To: spectrumanalyzer@yahoogroups.com
> > Subject: Re: [spectrumanalyzer] Re: lot of slim PCB boards on eBay
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> > Subject: Re: [spectrumanalyzer] Re: lot of slim PCB boards on eBay
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> > Sent: Wednesday, May 11, 2011 8:52 AM
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8059. Re: [spectrumanalyzer] Re: lot of slim PCB boards on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-11 20:04:47 UTC
From: sjkirby@pacbell.net
Topic: 8042 Message: 8059

Thank you for the help. I couldn't think of any problems it could create as long as I used gold type IC sockets.

Sent via DROID on Verizon Wireless

-----Original message-----
From: ed_k7ock <ed_k7ock@yahoo.com>
To: spectrumanalyzer@yahoogroups.com
Sent: Wed, May 11, 2011 14:52:45 GMT+00:00
Subject: [spectrumanalyzer] Re: lot of slim PCB boards on eBay

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> > > Hi All,
> > > Ã☐ I don't want to hurt anyone's feelings but I must make this comment. Any PWB that is not created from a released SLIM-PWB on the MSA web site is not truly, a SLIM. I'm not saying that other similar releases are not usable.
> > > Ã☐ I'll be more specific. If you take a released SLIM-PWB and have several made by Express, they are SLIMs. If you take a released SLIM-PWB and convert it to another CAD design for some other PWB house to manufacture, it will be a SLIM, but only if the conversion is 100% accurate. Any change to the pwb design negates its status as a "released SLIM".
> > > Scotty
> > >

> > > --- On Mon, 5/9/11, taishan_ma <taishan_ma@> wrote:
> > >
> > > From: taishan_ma <taishan_ma@>
> > > Subject: [spectrumanalyzer] lot of slim PCB boards on eBay
> > > To: mailto:spectrumanalyzer%40yahoogroups.com
> > > Date: Monday, May 9, 2011, 4:30 AM
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> > >
> > >
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> > > Hi all,
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> > >
> > >
> > > lot of slim PCB boards have been put on eBay.
> > >
> > >
> > >
> > > refer: http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=220781413022&ssPageName=STRK:MESELX:IT#ht_500wt_1156
> > >
> > >
> > >
> > > or visit: http://www.qsl.net/bg6khc/my_version.htm
> > >
> > >
> > >
> > > Tnx and 73!
> > >
> > > BG6KHC
> > >
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> >
> > ---

> >
> > No virus found in this message.
> > Checked by AVG - www.avg.com
> > Version: 10.0.1325 / Virus Database: 1500/3621 - Release Date: 05/06/11
> >
> >
> > ---
> >
> > No virus found in this message.
> > Checked by AVG - www.avg.com
> > Version: 10.0.1375 / Virus Database: 1500/3629 - Release Date: 05/10/11
> >
>

8060. Re: [spectrumanalyzer] Re: lot of slim PCB boards on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-11 21:27:40 UTC
From: william sprowls
Topic: 8042 Message: 8060

Hi All,
 Just a quick comment about "zapping" the 74ACT573 buffer I.C.
 I zapped one by shorting its output to ground. According to the mfg specs, this amount of current should not hurt the chip (BS). This was not a total zap, it did not totally die. The chip responded "almost" normally after the short.
 After the short occurred, the MSA would sometimes command to the wrong frequency. I traced the problem down to that IC output and found that its trailing edge (1 to 0) fall time had increased substantially. So, while its output signal was falling, other coupled lines created "glitches" on that output. In my opinion, the output impedance is what really changed (sink current), allowing "normal" line crosstalk to interfere with the output signal. The other 7 outputs worked perfectly.
 The bottom line to all this: shorting the buffer output may not result in a hard failure, but might introduce other weird soft failures. So, be careful about dropping stuff into your MSA with power on (like I did).
 Scotty

--- On Wed, 5/11/11, ed_k7ock <ed_k7ock@...> wrote:

From: ed_k7ock <ed_k7ock@...>
Subject: [spectrumanalyzer] Re: lot of slim PCB boards on eBay
To: spectrumanalyzer@yahoogroups.com
Date: Wednesday, May 11, 2011, 9:52 AM

I used the IC sockets on my control board and have been glad I did since I have managed to zap a couple of the IC. I used the socket that recommended, or at least mentioned, on the forum several years ago.

Ed G

8061. Re: lot of slim PCB boards on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-12 01:17:46 UTC
From: Dale
Topic: 8042 Message: 8061

I used to put everything in sockets. Not any more. Over time I have had more problems with the sockets causing problems than anything else. And do not use gold sockets, if the pins of the IC's are not gold plated, not many of them any more. Same reason they do not recommend mixing the tin plated pins with gold plated contacts.

I remember having to fix old ITT word processors. We took the cards out which were all wire wrapped, layed them on the floor and stepped on them to push all the IC's back down into their gold plated sockets. Fixed 95% of the problems with the old beasts. Go find a board that has had an IC in a socket for a while, and push down on the chip. It moves, you can push it back down, repeat in one month and the IC will have ridden up a bit again. Given enough time the contact will be broken.

The faster the electronics get the more problems the sockets seem to introduce also, so keep that in mind.

I would recommend you buy a good de-soldering station. I have a cheap one from circuit specialists, and it is some of the best money I have spent on my workbench. Makes quick work out of having to change an IC, or any other thing on the board.

Dale

8062. SLIM PCB Boards listed on ebay. Lot of 16 new

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-16 06:01:16 UTC
From: vna4sale
Topic: 8062 Message: 8062

A friend of mine just listed a lot of 16 PCB boards on ebay for sale (item number 180667798772) if anyone needs them to get their spectrum analyzer started. They bought 2 sets and these are the extras.

The listing is here: http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=180667798772

Also see Mini-Circuits listing from the same seller for the complete MiniCircuits kit unused. They will probably be auctioning off the built project in the next few days as well so stay tuned to that seller.

-Chris

8063. Mini-Circuits kit on ebay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-16 06:07:56 UTC
From: vna4sale
Topic: 8063 Message: 8063

Unused kit for sale on ebay if anyone is in the market:
http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=180667794661

This kit: http://www.scottyspectrumanalyzer.com/slimmsa/05QT--61201A.pdf

8064. Scottys VNA for sale on ebay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-17 05:16:12 UTC
From: vna4sale
Topic: 8064 Message: 8064

There is a constructed version of Scottys spectrum analyzer / network analyzer for sale on ebay.com item number 180668229309.

This listing can be found here:
http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=180668229309 if anyone is interested.

8065. Re: [spectrumanalyzer] Scottys VNA for sale on ebay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-17 11:01:06 UTC
From: Dr. Edward H. Currie
Topic: 8064 Message: 8065

Don

Here is a great chance to own your own personal spectrum analyzer.

Eddie

----- Original Message -----
From: vna4sale
To: spectrumanalyzer@yahoogroups.com
Sent: Tuesday, May 17, 2011 1:16 AM
Subject: [spectrumanalyzer] Scottys VNA for sale on ebay

There is a constructed version of Scottys spectrum analyzer / network analyzer for sale on ebay.com item number 180668229309.

This listing can be found here:
http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=180668229309 if anyone is interested.

8066. Re: [spectrumanalyzer] Scottys VNA for sale on ebay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-17 11:10:48 UTC
From: w4zcb
Topic: 8064 Message: 8066

That doesn't work.

W4ZCB

----- Original Message -----
From: "Dr. Edward H. Currie" <ehcurrie@...>
To: <spectrumanalyzer@yahoogroups.com>
Sent: Tuesday, May 17, 2011 7:01 AM
Subject: Re: [spectrumanalyzer] Scottys VNA for sale on ebay

Don

Here is a great chance to own your own personal spectrum analyzer.

Eddie

----- Original Message -----
From: vna4sale
To: spectrumanalyzer@yahoogroups.com
Sent: Tuesday, May 17, 2011 1:16 AM
Subject: [spectrumanalyzer] Scottys VNA for sale on ebay

There is a constructed version of Scottys spectrum analyzer /
network analyzer for sale on ebay.com item number 180668229309.

This listing can be found here:
http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=180668229309 if
anyone is interested.

8067. Re: [spectrumanalyzer] Scottys VNA for sale on ebay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-17 11:17:23 UTC
From: Dan Andersson
Topic: 8064 Message: 8067

True,

But he tells about what's not working and++

On his ebay shop, you'll find a bag of MiniCircuits parts on acution.

If it wherent for he abysmal shipping rates to Euroland, I'd gone for it
myself!

//Dan, M0DFI

On Tuesday 17 May 2011 12:10:48 you wrote:
> That doesn't work.
>
> W4ZCB
>
> ----- Original Message -----
> From: "Dr. Edward H. Currie" <ehcurrie@...>
> To: <spectrumanalyzer@yahoogroups.com>
> Sent: Tuesday, May 17, 2011 7:01 AM
> Subject: Re: [spectrumanalyzer] Scottys VNA for sale on ebay
>
>
> Don
>
> Here is a great chance to own your own personal spectrum analyzer.
>
> Eddie
>
>
> ----- Original Message -----
> From: vna4sale
> To: spectrumanalyzer@yahoogroups.com
> Sent: Tuesday, May 17, 2011 1:16 AM
> Subject: [spectrumanalyzer] Scottys VNA for sale on ebay
>
>
>
> There is a constructed version of Scottys spectrum analyzer /
> network analyzer for sale on ebay.com item number 180668229309.
>
> This listing can be found here:
> http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=180668229309 if
> anyone is interested.

8068. Crystal ladder filter board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-17 21:48:56 UTC
From: Steve
Topic: 8068 Message: 8068

Scotty,

With respect to the crystal ladder filter board PWB-CLF-5, did you intend that the crystal case be soldered to the bottom side of the PWB?

Thanks.

Steve

--
Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

8069. Re: [spectrumanalyzer] Crystal ladder filter board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-18 04:17:07 UTC
From: william sprowls
Topic: 8068 Message: 8069

Hi Steve,
 Yes. Soldering crystal cans to ground is "standard operating procedure" when building crystal filters.
Scotty

--- On Tue, 5/17/11, Steve <steve65@...> wrote:

From: Steve <steve65@...>
Subject: [spectrumanalyzer] Crystal ladder filter board
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, May 17, 2011, 4:48 PM

Scotty,

With respect to the crystal ladder filter board PWB-CLF-5, did you

intend that the crystal case be soldered to the bottom side of the PWB?

Thanks.

Steve

--

Read The Patriot Post Vertitas vos Liberabit

http://patriotpost.us/subscription/

8070. Re: Crystal ladder filter board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-18 14:48:47 UTC
From: Sam
Topic: 8068 Message: 8070

I did that on the amplifilter, but had a heck of a time getting the solder to stick to the can. Finally applied flux with a flux pen. Probably would have helped to use emery cloth on the can before installing.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Steve,
> Â Yes. Soldering crystal cans to ground is "standard operating procedure" when building crystal filters.
> Scotty
>
> --- On Tue, 5/17/11, Steve <steve65@...> wrote:
>
> From: Steve <steve65@...>
> Subject: [spectrumanalyzer] Crystal ladder filter board
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, May 17, 2011, 4:48 PM
>
> Scotty,
>
>
> With respect to the crystal ladder filter board PWB-CLF-5, did you
>
> intend that the crystal case be soldered to the bottom side of the PWB?
>
> Thanks,
>
> Steve
>>
> Read

8071. Re: Crystal ladder filter board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-18 16:22:44 UTC
From: Greg Broburg
Topic: 8068 Message: 8071

I would not solder near the bottom of the crystal can
for a solder sealed crystal. The atmosphere inside the
can is very very dry and any leaks around the solder
seal will allow moisture in over time. We are talking
microscopic pin holes here.

I have had to deal with this problem for years because
of the crystals used in King and Cessna aircraft radios
that were solder sealed. The failure mode of a crystal
with a leaky seal is strange, not sure what it would do
to a filter crystal but it cant be good.

If you want to ground the can of a solder sealed crystal
attach the ground at the top away from the seal area.

In my experience resistance weld crystals dont have
any appreciable leakage problems in the manner of
the solder sealed ones.

Greg

On 5/18/2011 8:48 AM, Sam wrote:
>
> I did that on the amplifilter, but had a heck of a time getting the
> solder to stick to the can. Finally applied flux with a flux pen.
> Probably would have helped to use emery cloth on the can before
> installing.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, william sprowls
> <wsprowls@...> wrote:
> >
> > Hi Steve,
> > ? Yes. Soldering crystal cans to ground is "standard operating
> procedure" when building crystal filters.
> > Scotty
> >
> > --- On Tue, 5/17/11, Steve <steve65@...> wrote:
> >
> > From: Steve <steve65@...>
> > Subject: [spectrumanalyzer] Crystal ladder filter board
> > To: spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>
> > Date: Tuesday, May 17, 2011, 4:48 PM
> >

> > Scotty,
> >
> >
> > With respect to the crystal ladder filter board PWB-CLF-5, did you
> >
> > intend that the crystal case be soldered to the bottom side of the PWB?
> >
> > Thanks,
> >
> > Steve
> >>
> > Read
>
>

8072. About USB2LPT (test slim_cb_nv board)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-19 03:54:31 UTC
From: taishan_ma
Topic: 8072 Message: 8072

hi,

I find that the USB2LPT (http://www-user.tu-chemnitz.de/~heha/bastelecke/Rund%20um%20den%20PC/USB2LPT/index.html.en) is not compatible with the layout of the slim_cb_nv.

The first pin (1th pin) of USB2LPT is just the 13th pin of the slim_cb_nv board. Anyone can give me some idea ?

my test: http://www.qsl.net/bg6khc/test_slim_cn_nv.htm

Thanks
BG6KHC

8073. Re: [spectrumanalyzer] About USB2LPT (test slim_cb_nv board)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-19 12:57:42 UTC
From: william sprowls
Topic: 8072 Message: 8073

I believe your USB2LPT is simulating a parallel port card, which has the 25 pin female connector. You need a standard Parallel Port cable, which has a 25 pin Male connector on each end.
 If your testing works, you could design a pwb with two 25 pin Male connectors to replace the parallel port cable.
Scotty

--- On Wed, 5/18/11, taishan_ma <taishan_ma@...> wrote:

From: taishan_ma <taishan_ma@...>
Subject: [spectrumanalyzer] About USB2LPT (test slim_cb_nv board)
To: spectrumanalyzer@yahoogroups.com
Date: Wednesday, May 18, 2011, 10:54 PM

hi,

I find that the USB2LPT (http://www-user.tu-chemnitz.de/~heha/bastelecke/Rund%20um%20den%20PC/USB2LPT/index.html.en) is not compatible with the layout of the slim_cb_nv.

The first pin (1th pin) of USB2LPT is just the 13th pin of the slim_cb_nv board. Anyone can give me some idea ?

my test: http://www.qsl.net/bg6khc/test_slim_cn_nv.htm

Thanks

BG6KHC

8074. Re: [spectrumanalyzer] About USB2LPT (test slim_cb_nv board)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-19 16:10:09 UTC
From: Jim Hontoria
Topic: 8072 Message: 8074

Because of timing issues the use of a USB TO LPT CONVERTER iS not recommended. you will most certainly run into a lot of odd issues.

Jim G. Hontoria, W1JGH

Sent from my iPhone

On May 18, 2011, at 11:54 PM, "taishan_ma" <taishan_ma@...> wrote:

> hi,
>
> I find that the USB2LPT (http://www-user.tu-chemnitz.de/~heha/bastelecke/Rund%20um%20den%20PC/USB2LPT/index.html.en) is not compatible with the layout of the slim_cb_nv.
>
> The first pin (1th pin) of USB2LPT is just the 13th pin of the slim_cb_nv board. Anyone can give me some idea ?
>
> my test: http://www.qsl.net/bg6khc/test_slim_cn_nv.htm
>
> Thanks
> BG6KHC
>
>

8075. Re: About USB2LPT (test slim_cb_nv board)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-20 00:41:47 UTC
From: taishan_ma
Topic: 8072 Message: 8075

A db25 pin converter PCB board has been designed and sent to a PWB house. (pic: http://www.qsl.net/bg6khc/test_slim_cn_nv.htm).

However, I'm really worry about "run into a lot of odd issues".

YJ BG6KHC

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> Because of timing issues the use of a USB TO LPT CONVERTER iS not recommended. you will most certainly run into a lot of odd issues.
>
> Jim G. Hontoria, W1JGH
>
> Sent from my iPhone
>
> On May 18, 2011, at 11:54 PM, "taishan_ma" <taishan_ma@...> wrote:
>
> > hi,
> >
> > I find that the USB2LPT (http://www-user.tu-chemnitz.de/~heha/bastelecke/Rund%20um%20den%20PC/USB2LPT/index.html.en) is not compatible with the layout of the slim_cb_nv.
> >
> > The first pin (1th pin) of USB2LPT is just the 13th pin of the slim_cb_nv board. Anyone can give me some idea ?
> >
> > my test: http://www.qsl.net/bg6khc/test_slim_cn_nv.htm
> >
> > Thanks
> > BG6KHC
> >
> >
>

8076. Re: About USB2LPT (test slim_cb_nv board)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-20 15:27:50 UTC
From: inlinebeginner
Topic: 8072 Message: 8076

I would wait for Scotty to publish a final version of this USB adaptor/control board.A parallel CB now is good enough for me to test my MSA.
Lin
--- In spectrumanalyzer@yahoogroups.com, "taishan_ma" <taishan_ma@...> wrote:
>
> A db25 pin converter PCB board has been designed and sent to a PWB house. (pic: http://www.qsl.net/bg6khc/test_slim_cn_nv.htm).
>
> However, I'm really worry about "run into a lot of odd issues".
>
> YJ BG6KHC
>
> --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@> wrote:
> >
> > Because of timing issues the use of a USB TO LPT CONVERTER iS not recommended. you will most certainly run into a lot of odd issues.
> >
> > Jim G. Hontoria, W1JGH
> >
> > Sent from my iPhone
> >
> > On May 18, 2011, at 11:54 PM, "taishan_ma" <taishan_ma@> wrote:
> >
> > > hi,
> > >
> > > I find that the USB2LPT (http://www-user.tu-chemnitz.de/~heha/bastelecke/Rund%20um%20den%20PC/USB2LPT/index.html.en) is not compatible with the layout of the slim_cb_nv.
> > >
> > > The first pin (1th pin) of USB2LPT is just the 13th pin of the slim_cb_nv board. Anyone can give me some idea ?
> > >
> > > my test: http://www.qsl.net/bg6khc/test_slim_cn_nv.htm
> > >
> > > Thanks
> > > BG6KHC
> > >
> > >
> >
>

8077. Re: [spectrumanalyzer] Re: About USB2LPT (test slim_cb_nv board)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-20 16:48:00 UTC
From: Geoff Moore
Topic: 8072 Message: 8077

>----- Original Message -----
>However, I'm really worry about "run into a lot of odd issues".

>YJ BG6KHC

It has been stated many times on this group that a standard parallel to USB adaptor that can be bought from various sources will NOT work in this application.

You will need to build a dedicated unit such as the one designed by G8KBB the details of which can be found on this group , look under the FILES section, USB controller.

This is a proven design which many users have built and used with another VNA.

Geoff

8078. Relays 75 ohm

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-22 02:17:22 UTC
From: Steve
Topic: 8078 Message: 8078

I saw some HP 8765A OPT 015 coaxial relays today in the flea market at the Dayton Hamvention. The HP datasheet <http://www.home.agilent.com/agilent/redirector.jspx?action=ref&cname=AGILENT_EDITORIAL&ckey=1000030385%3Aepsg%3Adow&lc=eng&cc=US&nfr=-11143.0.00&pselect=SR.GENERAL> lists the relay impedance as 75 ohms, 55mH.

I do not know what to make of the 55mH part of that spec, but the 75 ohms is obviously different from the 50 ohm RF paths in the MSA.

What would be the effect of using these relays for the the 1G-2G-3G switching? Big problem? Little problem? Somewhere in between?

Thanks.

Steve K8JQ

8079. Re: Relays 75 ohm

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-22 14:04:36 UTC
From: Sam
Topic: 8078 Message: 8079

75 ohms is no problem. Because of the short signal path through the relay, the effect is minor at 10.7 MHz, and is probably negligible compared to the non-50-ohm output impedance of Mixer 2. There might be a tiny effect on signal strength, but whatever it is would be accounted for in path and frequency calibration, along with mixer losses, etc.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
>
> I saw some HP 8765A OPT 015 coaxial relays today in the flea market at
> the Dayton Hamvention. The HP datasheet
> <http://www.home.agilent.com/agilent/redirector.jspx?action=ref&cname=AGILENT_EDITORIAL&ckey=1000030385%3Aepsg%3Adow&lc=eng&cc=US&nfr=-11143.0.00&pselect=SR.GENERAL>
> lists the relay impedance as 75 ohms, 55mH.
>
> I do not know what to make of the 55mH part of that spec, but the 75
> ohms is obviously different from the 50 ohm RF paths in the MSA.
>
> What would be the effect of using these relays for the the 1G-2G-3G
> switching? Big problem? Little problem? Somewhere in between?
>
> Thanks.
>
> Steve K8JQ
>

8080. Does anyone have a spare amplifilter PCB that I could purchase.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-22 16:53:52 UTC
From: Mark
Topic: 8080 Message: 8080

Does anyone have a spare amplifilter PCB. If so I would be interested in purchasing it.

Thanks
Mark

8081. Re: Relays 75 ohm

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-22 19:23:50 UTC
From: undercoupled
Topic: 8078 Message: 8081

The 75 Ohm, 55 mH specification is the solenoid resistance and inductance, not the RF path impedance.

Jerry

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
>
> I saw some HP 8765A OPT 015 coaxial relays today in the flea market at
> the Dayton Hamvention. The HP datasheet
> <http://www.home.agilent.com/agilent/redirector.jspx?action=ref&cname=AGILENT_EDITORIAL&ckey=1000030385%3Aepsg%3Adow&lc=eng&cc=US&nfr=-11143.0.00&pselect=SR.GENERAL>
> lists the relay impedance as 75 ohms, 55mH.
>
> I do not know what to make of the 55mH part of that spec, but the 75
> ohms is obviously different from the 50 ohm RF paths in the MSA.
>
> What would be the effect of using these relays for the the 1G-2G-3G
> switching? Big problem? Little problem? Somewhere in between?
>
> Thanks.
>
> Steve K8JQ
>

8082. Re: [spectrumanalyzer] Re: Relays 75 ohm

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-23 11:12:17 UTC
From: Steve
Topic: 8078 Message: 8082

Thanks Sam and Jerry. I should have been more attentive when reading the data sheet. Looks like these relays should work OK. I bought two of them for $10ea, now I kinda wish I'd got a few more.

Steve K8JQ

On 5/22/2011 3:23 PM, undercoupled wrote:
> The 75 Ohm, 55 mH specification is the solenoid resistance and inductance, not the RF path impedance.
>
> Jerry
>
> --- In spectrumanalyzer@yahoogroups.com, Steve<steve65@...> wrote:
>> I saw some HP 8765A OPT 015 coaxial relays today in the flea market at
>> the Dayton Hamvention. The HP datasheet
>> <http://www.home.agilent.com/agilent/redirector.jspx?action=ref&cname=AGILENT_EDITORIAL&ckey=1000030385%3Aepsg%3Adow&lc=eng&cc=US&nfr=-11143.0.00&pselect=SR.GENERAL>
>> lists the relay impedance as 75 ohms, 55mH.
>>
>> I do not know what to make of the 55mH part of that spec, but the 75
>> ohms is obviously different from the 50 ohm RF paths in the MSA.
>>
>> What would be the effect of using these relays for the the 1G-2G-3G
>> switching? Big problem? Little problem? Somewhere in between?
>>
>> Thanks.
>>
>> Steve K8JQ
>>
>
>
>
> ------------------------------------
>
> Yahoo! Groups Links
>
>
>
>

8083. Re: Does anyone have a spare amplifilter PCB that I could purchase.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-23 21:01:11 UTC
From: Sam
Topic: 8080 Message: 8083

If nobody has a spare, you might consider ordering a set of 3 Miniboards from ExpressPCB for about $60. Three amplifilters fit on one board so you would have a total of 9. If a few others are also interested, you could end up with a board for a decent price.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Mark" <mark@...> wrote:
>
> Does anyone have a spare amplifilter PCB. If so I would be interested in purchasing it.
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> Thanks
> Mark
>

8084. Re: [spectrumanalyzer] Does anyone have a spare amplifilter PCB that I could purchase.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-23 21:15:55 UTC
From: William Dillon
Topic: 8080 Message: 8084

Another option, if you're feeling adventurous, is to try a clone I made of the amplifier design that is compatible with other board houses. You could get one for about $15 from BatchPCB. There are other options as well. Keeping in mind that it wouldn't be a "Released SLIM", using Scotty's nomenclature for variant designs.

- Will

On May 23, 2011, at 2:01 PM, Sam wrote:

> If nobody has a spare, you might consider ordering a set of 3 Miniboards from ExpressPCB for about $60. Three amplifilters fit on one board so you would have a total of 9. If a few others are also interested, you could end up with a board for a decent price.
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8085. Re: Does anyone have a spare amplifilter PCB that I could purchase.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-23 22:55:10 UTC
From: Sam
Topic: 8080 Message: 8085

The amplifilter isn't actually an "official SLIM" anyway. It is slightly smaller than the double-SLIM size. I figured that if anyone wanted to make it SLIM size, they could easily pad it. Will, have you actually constructed the amplifilter with your board?

Sam W.

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8086. Re: [spectrumanalyzer] Does anyone have a spare amplifilter PCB that I could purchase.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-23 23:11:20 UTC
From: William Dillon
Topic: 8080 Message: 8086

No, I haven't yet.

That would by the reason behind the "adventurous" qualifier.

On May 23, 2011, at 3:55 PM, Sam wrote:

> The amplifilter isn't actually an "official SLIM" anyway. It is slightly smaller than the double-SLIM size. I figured that if anyone wanted to make it SLIM size, they could easily pad it. Will, have you actually constructed the amplifilter with your board?
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8087. Re: About USB2LPT (test slim_cb_nv board)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-24 00:31:05 UTC
From: taishan_ma
Topic: 8072 Message: 8087

Thanks Geoff.

I have completed the test of my version's slim_cb_nv with USB2LPT along with slim_adc16 and slim_logdet by using Ver115 test program.

It seems that no odd issues encountered.

I have updated the test results on my website:

http://www.qsl.net/bg6khc/test_slim_cn_nv.htm

http://www.qsl.net/bg6khc/test_slim_logdet_and_adc16.htm

Thanks.

BG6KHC

--- In spectrumanalyzer@yahoogroups.com, "Geoff Moore" <m0ore@...> wrote:
>
> >----- Original Message -----
> >However, I'm really worry about "run into a lot of odd issues".
>
> >YJ BG6KHC
>
> It has been stated many times on this group that a standard parallel to USB
> adaptor that can be bought from various sources will NOT work in this
> application.
>
> You will need to build a dedicated unit such as the one designed by G8KBB
> the details of which can be found on this group , look under the FILES
> section, USB controller.
>
> This is a proven design which many users have built and used with another
> VNA.
>
> Geoff
>

8088. RE: [spectrumanalyzer] Does anyone have a spare amplifilter PCB that I could purchase.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-24 07:15:24 UTC
From: Mark Burgin
Topic: 8080 Message: 8088

Thanks for the offer, Will, but I am still hoping that someone has a spare. After all, they are always ordered in 3s!
If I can't get one, then I will have a go at transferring it into another package myself. My biggest problem with getting PCBs made is the cost most companies charge for shipping to the UK (ExpressPCB want $50 for shipping!). I have seen several Chinese companies on Ebay offereing a low cost service (and a reasonable $15 shipping cost). Anyone have any experience or comments on these?

Mark

From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of William Dillon
Sent: 24 May 2011 00:11
To: spectrumanalyzer@yahoogroups.com
Subject: Re: [spectrumanalyzer] Does anyone have a spare amplifilter PCB that I could purchase.

No, I haven't yet.

That would by the reason behind the "adventurous" qualifier.

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8089. RE: [spectrumanalyzer] Does anyone have a spare amplifilter PCB that I could purchase.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-24 08:16:29 UTC
From: NeilDouglas
Topic: 8080 Message: 8089

Mark,

I use Olimex for low cost prototypes.

Regards

NeilD

From: spectrumanalyzer@yahoogroups.com
[mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of Mark Burgin
Sent: 24 May 2011 08:15
To: spectrumanalyzer@yahoogroups.com
Subject: RE: [spectrumanalyzer] Does anyone have a spare amplifilter PCB
that I could purchase.

Thanks for the offer, Will, but I am still hoping that someone has a spare.
After all, they are always ordered in 3s!

If I can't get one, then I will have a go at transferring it into another
package myself.

My biggest problem with getting PCBs made is the cost most companies charge
for shipping to the UK (ExpressPCB want $50 for shipping!). I have seen
several Chinese companies on Ebay offereing a low cost service (and a
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8090. Re: [spectrumanalyzer] Does anyone have a spare amplifilter PCB that I could purchase.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-24 14:10:54 UTC
From: William Dillon
Topic: 8080 Message: 8090

There's a company called "iTead" that offers a somewhat unique service. They have 10 boards smaller than 5cm by 5cm for $12.

However, there are some caveats. I don't know how many people know about Dave Jones of EEVBlog, but he tried them out:

http://www.eevblog.com/2011/03/11/eevblog-155-itead-studio-pcb-prototype-goof/

The real issue he faced was the minimum trace/space sizes. None of the SLIM boards would have this issue.

- Will

http://iteadstudio.com/store/index.php?main_page=index&cPath=19_20

On May 24, 2011, at 12:15 AM, Mark Burgin wrote:

>
> Thanks for the offer, Will, but I am still hoping that someone has a spare. After all, they are always ordered in 3s!
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> If I can't get one, then I will have a go at transferring it into another package myself.
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> To: spectrumanalyzer@yahoogroups.com
> Subject: Re: [spectrumanalyzer] Does anyone have a spare amplifilter PCB that I could purchase.
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8091. RE: [spectrumanalyzer] Does anyone have a spare amplifilter PCB that I could purchase.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-24 19:56:44 UTC
From: Mark Burgin
Topic: 8080 Message: 8091

I have just had a look at the iTead web site and their prices are truly incredible! They currently have an offer for 10 off, 5cm * 5cm double sided PCBs for $9.90 for all 10! Don't know about the delivery costs yet, but they despatch from China via air mail which isn't usually too expensive, but a bit slow (compared with UPS and FedEx, anyway).
I watched the Dave Jones video and note the issue with 6mil/6mil track width/spacing but it looks like everything would be OK at 8mil and above. I don't image this will be a problem with any of the SLIM designs.
It's a shame that their standard sizes of 5cm * 5cm or 10cm * 10cm ($24.90 for 10) don't fit the SLIM sizes very well, but at the price I shouldn't complain. The only issue I can see is that they state "Single design, no panelizing" and so I guess that means that I can't put several SLIMS on one 10cm * 10cm board. I would need to shrink the PCB for the amlifilter by about 5mm to make it fit within 5cm * 5cm, but that looks quite possible without changing the design significantly.
I think I will try to convert the amlifilter to Eagle format and give them a go. I will report back to the group how I get on, but don't hold your breath - I'm a novice with Eagle!

Mark

From: spectrumanalyzer@...m [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of William Dillon
Sent: 24 May 2011 15:11
To: spectrumanalyzer@yahoogroups.com
Subject: Re: [spectrumanalyzer] Does anyone have a spare amplifilter PCB that I could purchase.

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However, there are some caveats. I don't know how many people know about Dave Jones of EEVBlog, but he tried them out:

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- Will

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Mark

From: spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer@yahoogroups.com>
[mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of William Dillon
Sent: 24 May 2011 00:11
To: spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer@yahoogroups.com>
Subject: Re: [spectrumanalyzer] Does anyone have a spare amplifilter PCB that I could purchase.

No, I haven't yet.

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8092. Re: Does anyone have a spare amplifilter PCB that I could purchase.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-24 23:19:55 UTC
From: Sam
Topic: 8080 Message: 8092

The iTead prices are generally good, but it is inefficient to have to use a 5x5 cm board to get a single SLIM (approx. 3x3 cm). But in the case of the amplifilter, a simple redesign could shorten it so it would fit into a 5x5 cm board. The impedance matching at each end uses two trimmer caps, each in parallel with a fixed cap. The trimmers could be omitted; they are completely unnecessary. Likewise, two series inductors are allowed, so you can get closer to the desired value, but that is also unnecessary, so one of the inductors could be omitted. I ended up jumpering over the impedance matching at one end, and using fixed components at the other end. It turned out that it wasn't really necessary to do impedance matching, but one impedance matching circuit is still useful to provide a low-pass filter, whose component values aren't all that critical.

On the 6/6 issue: I don't think I have ever used a trace narrower than 10 mils on an MSA board, and the default clearance around pads and traces in ExpressPCB is 12 mils, so there is no need to push anywhere close to the iTead 6/6 limit. (The narrowest trace on the amplifilter board is probably 15 mils.)

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Mark Burgin <mark@...> wrote:
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> Sent: 24 May 2011 15:11
> To: spectrumanalyzer@yahoogroups.com
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8093. Cavity filter polishing?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-25 05:29:35 UTC
From: William Dillon
Topic: 8093 Message: 8093

I have to admit I feel like this is a stupid question, but I have to ask. Is it vital that the inside of the cavity filter be polished? Is there some kind of electron cloud that forms inside that must be able to conduct with the walls of the pipe? I finished a filter and it doesn't work at all. Then I thought about other peoples filters and the silver plating and thought "why would they do that unless the inside surface had to be extra-conducitve to the inside air. Is it likely that this is the reason mine doesn't work?

Thanks!
- Will

8094. Re: [spectrumanalyzer] Cavity filter polishing?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-25 11:17:35 UTC
From: w4zcb
Topic: 8093 Message: 8094

No Will, you have to find some other reason. It'd work with a dirty insides. The silver plate is just "feel good".

W4ZCB

----- Original Message -----
From: "William Dillon" <hpux735@...>
To: <spectrumanalyzer@yahoogroups.com>
Sent: Wednesday, May 25, 2011 1:29 AM
Subject: [spectrumanalyzer] Cavity filter polishing?

I have to admit I feel like this is a stupid question, but I have to ask. Is it vital that the inside of the cavity filter be polished? Is there some kind of electron cloud that forms inside that must be able to conduct with the walls of the pipe? I finished a filter and it doesn't work at all. Then I thought about other peoples filters and the silver plating and thought "why would they do that unless the inside surface had to be extra-conducitve to the inside air. Is it likely that this is the reason mine doesn't work?

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8095. Re: [spectrumanalyzer] Cavity filter polishing?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-25 13:57:21 UTC
From: SFC
Topic: 8093 Message: 8095

Sometimes it's the way you tune it e.g. I started with the last cavity screw and worked towards the input.
You can't do much wrong here, maybe with a wider bw or insertion loss, unless you have a short or open connection.

Simon

----- Original Message -----
From: w4zcb
To: spectrumanalyzer@yahoogroups.com
Sent: Wednesday, May 25, 2011 1:17 PM
Subject: Re: [spectrumanalyzer] Cavity filter polishing?

No Will, you have to find some other reason. It'd work with a dirty insides. The silver plate is just "feel good".

W4ZCB

----- Original Message -----
From: "William Dillon" <hpux735@...>
To: <spectrumanalyzer@yahoogroups.com>
Sent: Wednesday, May 25, 2011 1:29 AM
Subject: [spectrumanalyzer] Cavity filter polishing?

I have to admit I feel like this is a stupid question, but I have to ask. Is it vital that the inside of the cavity filter be polished? Is there some kind of electron cloud that forms inside that must be able to conduct with the walls of the pipe? I finished a filter and it doesn't work at all. Then I thought about other peoples filters and the silver plating and thought "why would they do that unless the inside surface had to be extra-conducitve to the inside air. Is it likely that this is the reason mine doesn't work?

Thanks!
- Will

_____ NOD32 6151 (20110525) Informatie _____

Dit bericht is gecontroleerd door het NOD32 Antivirus Systeem.
http://www.nod32.nl

8096. Re: Cavity filter polishing?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-25 14:18:52 UTC
From: Sam
Topic: 8093 Message: 8096

If you don't have an actual bad connection or shorting problem (maybe with a coupling loop or with a tuning screw touching the center pipe), you should be able to get some kind of response even with various types of defects, and the shininess of the insides is not a factor.

Current flows up and down the resonators and up and down the cavity walls, interacting magnetically with the coupling loops. The tuning screws add a little capacitance to the end of the resonators, which has the same effect as altering their length. Due to skin effect, the current in the cavity is very near the surface of the copper. I have read statements to the effect that in an oxidized cavity you are forcing the current through the high-resistance oxide because the oxide constitutes the surface. However, skin-depth calculations take resistance into account, and a thin high-resistance coating does not affect the current flow in the underlying copper. (A thick layer would create some dielectric loss that would affect the Q of the cavity, but would not prevent it from working.)

For the heck of it, I filled a cavity with polyurethane foam. The cavity still worked, with lower Q. Overall, it was a disaster because when you heat the cavity to put the top on, the foam wants to expand again.

The issue may be tuning. If the cavities are not tuned to approximately the same frequency, you may not get any response. If all your center resonators are the same length, and all your tuning screws are set to the same depth (and don't touch the resonator), then you should have a decent starting point for tuning and you should see some response. If the resonators are not the same length (measured from the open end of the resonator to the inside bottom of the cavity), it may take some trial and error tuning to get the frequencies close enough to see a response. (Even if you cut the resonators to equal lengths, they may have different lengths projecting inside the cavity.)

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "w4zcb" <w4zcb@...> wrote:
>
> No Will, you have to find some other reason. It'd work with a dirty
> insides. The silver plate is just "feel good".
>
> W4ZCB
>
> ----- Original Message -----
> From: "William Dillon" <hpux735@...>
> To: <spectrumanalyzer@yahoogroups.com>
> Sent: Wednesday, May 25, 2011 1:29 AM
> Subject: [spectrumanalyzer] Cavity filter polishing?
>
>
> I have to admit I feel like this is a stupid question, but I have to

> ask. Is it vital that the inside of the cavity filter be polished?
> Is there some kind of electron cloud that forms inside that must be
> able to conduct with the walls of the pipe? I finished a filter and
> it doesn't work at all. Then I thought about other peoples filters
> and the silver plating and thought "why would they do that unless the
> inside surface had to be extra-conducitve to the inside air. Is it
> likely that this is the reason mine doesn't work?
>
> Thanks!
> - Will
>

8097. Re: [spectrumanalyzer] Re: Cavity filter polishing?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-25 14:37:58 UTC
From: William Dillon
Topic: 8093 Message: 8097

Thanks to everyone that has responded so far. I'm working on building a new filter to hopefully rule out some building deficiencies. I certainly learned a lot about the building process with the first filter. When I hooked it up to the analyzer, it looked exactly the same as an open connection. I thought there was some kind of lacquer coating on the inside of plumbing pipes, but I guess not, and from what it sounds like it wouldn't matter anyway.

Thanks again,
- Will

On May 25, 2011, at 7:18 AM, Sam wrote:

> If you don't have an actual bad connection or shorting problem (maybe with a coupling loop or with a tuning screw touching the center pipe), you should be able to get some kind of response even with various types of defects, and the shininess of the insides is not a factor.
>
> Current flows up and down the resonators and up and down the cavity walls, interacting magnetically with the coupling loops. The tuning screws add a little capacitance to the end of the resonators, which has the same effect as altering their length. Due to skin effect, the current in the cavity is very near the surface of the copper. I have read statements to the effect that in an oxidized cavity you are forcing the current through the high-resistance oxide because the oxide constitutes the surface. However, skin-depth calculations take resistance into account, and a thin high-resistance coating does not affect the current flow in the underlying copper. (A thick layer would create some dielectric loss that would affect the Q of the cavity, but would not prevent it from working.)
>
> For the heck of it, I filled a cavity with polyurethane foam. The cavity still worked, with lower Q. Overall, it was a disaster because when you heat the cavity to put the top on, the foam wants to expand again.
>
> The issue may be tuning. If the cavities are not tuned to approximately the same frequency, you may not get any response. If all your center resonators are the same length, and all your tuning screws are set to the same depth (and don't touch the resonator), then you should have a decent starting point for tuning and you should see some response. If the resonators are not the same length (measured from the open end of the resonator to the inside bottom of the cavity), it may take some trial and error tuning to get the frequencies close enough to see a response. (Even if you cut the resonators to equal lengths, they may have different lengths projecting inside the cavity.)
>
> Sam W.
>
> --- In spectrumanalyzer@...m, "w4zcb" <w4zcb@...> wrote:
> >
> > No Will, you have to find some other reason. It'd work with a dirty
> > insides. The silver plate is just "feel good".

> >
> > W4ZCB
> >
> > ----- Original Message -----
> > From: "William Dillon" <hpux735@...>
> > To: <spectrumanalyzer@yahoogroups.com>
> > Sent: Wednesday, May 25, 2011 1:29 AM
> > Subject: [spectrumanalyzer] Cavity filter polishing?
> >
> >
> > I have to admit I feel like this is a stupid question, but I have to
> > ask. Is it vital that the inside of the cavity filter be polished?
> > Is there some kind of electron cloud that forms inside that must be
> > able to conduct with the walls of the pipe? I finished a filter and
> > it doesn't work at all. Then I thought about other peoples filters
> > and the silver plating and thought "why would they do that unless the
> > inside surface had to be extra-conducitve to the inside air. Is it
> > likely that this is the reason mine doesn't work?
> >
> > Thanks!
> > - Will
> >
>
>

8098. Visual Guide

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-27 00:32:58 UTC
From: Sam
Topic: 8098 Message: 8098

I have posted a file called MSA_VisualGuide in the Files section. It is an attempt to explain the use of the MSA by presenting an overview of the main windows (main graph, Smith chart and Two-Port windows) and their menus and controls. It does not get into great detail on every use of the MSA--such as crystal analysis--but is intended to help the user find where to go to do what needs to be done. Let me know what you think.

Sam W.

8099. Active Return Bridge (ARB) RLC Offset Network for Impedance Measurements

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-27 12:22:00 UTC
From: lh1907
Topic: 8099 Message: 8099

The primary purpose of this post is to describe how the RLC Offset Network is used with Sam W's RL_To_Impedance spreadsheet to measure antenna impedance at HF. A homebrew HF receiver with 10.7 MHz (7 KHz BW) 1st IF was used to measure ARB response amplitudes.

Three more pics are uploaded to the Larry_W2HHV folder.

1. RLC_OffsetNetwork.JPG: This network is used to provide a series R+_jX offset control of impedance circle center position in RL_To_Impedance spreadsheet.

2. ActBridgeFixture.JPG: Shows the physical layout of the ARB, Buffer Amps, 10 dB attenuator interface to RLC_OffsetNetwork. The "To Zx" connector is connector to a 49.9 ohm load which is used to determine value of Calibrated Air Capacitor (Cvar) which resonates with selected switchable inductor. Knowing the series L value at measurement frequency, all other offset reactance values can be determined for any other Cvar setting.

3. Z_RL_Circles.bmp: The measurement conditions for the four impedance circles are:

a. 49.9 ohm load, LC Network at resonance - This measurement is used to calculate the inductance of select inductor(s) based on Cvar setting. Cvar=118.6pF; Both reactances = 132.9 ohms.

b. Series C - With LC Network connected to Zx and Series R=0, Cvar is adjusted to maximum Return Loss (RL) at some capacitor setting near mid range of Cvar. Zx generates the smallest impedance circle possible for the Zx value being measured. Cvar=314.8 pF, -jX = 50.1 ohms (Xoffset=+j82.8 ohms based on case a measurement);

c. Series C1 - Cvar is varied from the Series C setting (case b) to reduce RL by about 6 dB. Or use Cvar setting which reduces RL by the largest value possible below 6dB. Cvar=166.0pF, -jX = 94.95 ohms (Xoffset=+j37.95 ohms based on case a measurement); and

d. Series R/X - Return Cvar to min Zx value of case b. Insert series R value to reduce RL by about 6 dB. Or use series R which reduces RL by the largest value possible below 6dB. Series R = 53.2 ohms and Xoffset=+j82.8 ohms.

To summarize the measurement sequence.

1. Pick a stepped L value which results in the net reactance of series L/Cvar network being a conjugate match to Zx reactance (case b). This is maximum RL possible for Zx being measured.

2. Replace Zx with a 49.9 ohm load and adjust Cvar for max RL. L/Cvar reactances are equal at this series resonance condition. Calculate +jX value of L from know Cvar value. (case a above).

3. Reconnect Zx and adjust Cvar for about 6db reduction in maximum RL value (measurement 1).

4. Return Cvar to maximum RL condition (measurement 1) and insert series R for about 6db reduction in maximum RL value (measurement 1).

Measurements 1 and 3 are reactance offsets only and measurement 4 is a resistance and reactance offset measurement. By including the LC resonance impedance circle on Impedance Graph, the maximum resistance width and reactance height of impedance triangulation box for Zx measurement can be checked relative to ARB characteristics for measurement frequency (10.098 MHz).

Since I am using this ARB Fixture to measure the impedance of a one wavelength, 80 meter, horizontal loop antenna, I do not expect to measure any high impedances which involve adding a parallel R offset. The Cvar range (31 to 472 pF) and L range (2 to 30 uH in 2 uH steps) should be suffice to characterize this antenna over 3-30 MHz HF range. Self resonance frequency of parasitic inductance of LC Network is 50 MHz, so the "no L selected" condition should provide enough offset from the 2 uH L value to measure Zx at 10 meters. The Cvar min may not be low enough. Time will tell.

I used a QRP LC Network antenna tuner to match antenna using ARB at 10.098 MHz (RL = - 41.5 dB). This tuner has a calibrated air capacitor. I use the shunt network, to determine resonant C value at measurement frequency for the L value of match condition. Then, the L value was calculated. Using these LC match values, the Zx value was "reverse" calculated.

Results are:
QRP Tuner: Zx = 42 -J73.7 ohms
ARB Impedance Circles: Zx = 49 -j71 ohms

Larry, W2HHV

8100. Re: Active Return Bridge (ARB) RLC Offset Network for Impedance Measurements

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-27 16:01:41 UTC
From: Sam
Topic: 8099 Message: 8100

Larry,
Nicely done. I had forgotten about that spreadsheet. For those who haven't seen it, it allows you to measure impedance and related quantities using 3 measurements of Return Loss, one with the DUT alone, and the others with a resistor and then a capacitor in series with the DUT. In effect, it lets you measure both magnitude and phase with just a good return loss bridge; no VNA required. The three RL measurements each generate a circle of possible impedances, and the solution is where all three intersect. (Depending on the scaling of the graph, the circles may actually look like ellipses, but the intersect point is still the same.)

I noticed that the instructions in the spreadsheet refer to using a parallel resistor and capacitor, whereas the data entry boxes specify series R and C. I uploaded a corrected version to consistently refer to series components; it's on my website under Manual Return Loss Measurement. Larry, I see that you used series components, and you apparently also somewhat customized the spreadsheet and procedure. It appears to have worked well.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@...> wrote:
>
> The primary purpose of this post is to describe how the RLC Offset Network is used with Sam W's RL_To_Impedance spreadsheet to measure antenna impedance at HF. A homebrew HF receiver with 10.7 MHz (7 KHz BW) 1st IF was used to measure ARB response amplitudes.
>
> Three more pics are uploaded to the Larry_W2HHV folder.
>
> 1. RLC_OffsetNetwork.JPG: This network is used to provide a series R+_jX offset control of impedance circle center position in RL_To_Impedance spreadsheet.
>
> 2. ActBridgeFixture.JPG: Shows the physical layout of the ARB, Buffer Amps, 10 dB attenuator interface to RLC_OffsetNetwork. The "To Zx" connector is connector to a 49.9 ohm load which is used to determine value of Calibrated Air Capacitor (Cvar) which resonates with selected switchable inductor. Knowing the series L value at measurement frequency, all other offset reactance values can be determined for any other Cvar setting.
>
> 3. Z_RL_Circles.bmp: The measurement conditions for the four impedance circles are:
>
> a. 49.9 ohm load, LC Network at resonance - This measurement is used to calculate the inductance of select inductor(s) based on Cvar setting. Cvar=118.6pF; Both reactances = 132.9 ohms.
>
> b. Series C - With LC Network connected to Zx and Series R=0, Cvar is adjusted to maximum Return Loss (RL) at some capacitor setting near mid range of Cvar. Zx generates the smallest impedance circle possible for the Zx value being measured. Cvar=314.8 pF, -jX =

50.1 ohms (Xoffset=+j82.8 ohms based on case a measurement);
>
> c. Series C1 - Cvar is varied from the Series C setting (case b) to reduce RL by about 6 dB. Or use Cvar setting which reduces RL by the largest value possible below 6dB. Cvar=166.0pF, -jX = 94.95 ohms (Xoffset=+j37.95 ohms based on case a measurement); and
>
> d. Series R/X - Return Cvar to min Zx value of case b. Insert series R value to reduce RL by about 6 dB. Or use series R which reduces RL by the largest value possible below 6dB. Series R = 53.2 ohms and Xoffset=+j82.8 ohms.
>
> To summarize the measurement sequence.
>
> 1. Pick a stepped L value which results in the net reactance of series L/Cvar network being a conjugate match to Zx reactance (case b). This is maximum RL possible for Zx being measured.
>
> 2. Replace Zx with a 49.9 ohm load and adjust Cvar for max RL. L/Cvar reactances are equal at this series resonance condition. Calculate +jX value of L from know Cvar value. (case a above).
>
> 3. Reconnect Zx and adjust Cvar for about 6db reduction in maximum RL value (measurement 1).
>
> 4. Return Cvar to maximum RL condition (measurement 1) and insert series R for about 6db reduction in maximum RL value (measurement 1).
>
> Measurements 1 and 3 are reactance offsets only and measurement 4 is a resistance and reactance offset measurement. By including the LC resonance impedance circle on Impedance Graph, the maximum resistance width and reactance height of impedance triangulation box for Zx measurement can be checked relative to ARB characteristics for measurement frequency (10.098 MHz).
>
> Since I am using this ARB Fixture to measure the impedance of a one wavelength, 80 meter, horizontal loop antenna, I do not expect to measure any high impedances which involve adding a parallel R offset. The Cvar range (31 to 472 pF) and L range (2 to 30 uH in 2 uH steps) should be suffice to characterize this antenna over 3-30 MHz HF range. Self resonance frequency of parasitic inductance of LC Network is 50 MHz, so the "no L selected" condition should provide enough offset from the 2 uH L value to measure Zx at 10 meters. The Cvar min may not be low enough. Time will tell.
>
> I used a QRP LC Network antenna tuner to match antenna using ARB at 10.098 MHz (RL = -41.5 dB). This tuner has a calibrated air capacitor. I use the shunt network, to determine resonant C value at measurement frequency for the L value of match condition. Then, the L value was calculated. Using these LC match values, the Zx value was "reverse" calculated.
>
> Results are:
> QRP Tuner: Zx = 42 -J73.7 ohms
> ARB Impedance Circles: Zx = 49 -j71 ohms
>
> Larry, W2HHV
>

8101. Response difference with/without RFA_1 in TG mode

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-28 01:50:29 UTC
From: inlinebeginner
Topic: 8101 Message: 8101

The difference can be 20dB at 300kHz between with and with out RFA_1 in TG mode. I put a photo here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1019394296/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc

Lin

8102. Steps/sweep in V116 RevD

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-28 02:18:06 UTC
From: inlinebeginner
Topic: 8102 Message: 8102

Sam
If I put a 10000 for Steps/sweep, the software will stop running. Maybe we need put a limit for this number.
Lin

8103. Re: [spectrumanalyzer] Response difference with/without RFA_1 in TG mode

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-28 04:26:11 UTC
From: william sprowls
Topic: 8101 Message: 8103

Hi Lin,
You are doing better than a 20 dB improvement. Your "with" trace is down in the mud and a good difference between the two traces cannot be made. However, I'm guessing you have about a 30 dB improvement. Good going.
Scotty

--- On Fri, 5/27/11, inlinebeginner <inlinebeginner@...> wrote:

From: inlinebeginner <inlinebeginner@...>
Subject: [spectrumanalyzer] Response difference with/without RFA_1 in TG mode
To: spectrumanalyzer@yahoogroups.com
Date: Friday, May 27, 2011, 8:50 PM

The difference can be 20dB at 300kHz between with and with out RFA_1 in TG mode. I put a photo here:

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1019394296/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc

Lin

8104. Re: [spectrumanalyzer] Steps/sweep in V116 RevD

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-28 04:29:16 UTC
From: william sprowls
Topic: 8102 Message: 8104

Hi Lin,
Are you sure it really stopped running? On my computer, 10,000 steps requires about one minute before the sweep will start scanning. It takes time to calculate all the steps and put the commanding information into the software arrays.
Scotty

--- On Fri, 5/27/11, inlinebeginner <inlinebeginner@...> wrote:

From: inlinebeginner <inlinebeginner@...>
Subject: [spectrumanalyzer] Steps/sweep in V116 RevD
To: spectrumanalyzer@yahoogroups.com
Date: Friday, May 27, 2011, 9:18 PM

Sam

If I put a 10000 for Steps/sweep, the software will stop running. Maybe we need put a limit for this number.

Lin

8105. Re: Steps/sweep in V116 RevD

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-28 07:34:35 UTC
From: inlinebeginner
Topic: 8102 Message: 8105

Scotty
You are right. I did not wait enough time. After I wait about 40 seconds, it is ready to sweep. Maybe we can put a reminder somewhere, if the number is above 5000.
Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Lin,
> Are you sure it really stopped running? On my computer, 10,000 steps requires about one minute before the sweep will start scanning. It takes time to calculate all the steps and put the commanding information into the software arrays.
> Scotty
>
> --- On Fri, 5/27/11, inlinebeginner <inlinebeginner@...> wrote:
>
> From: inlinebeginner <inlinebeginner@...>
> Subject: [spectrumanalyzer] Steps/sweep in V116 RevD
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, May 27, 2011, 9:18 PM
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> Sam
>
> If I put a 10000 for Steps/sweep, the software will stop running. Maybe we need put a limit for this number.
>
> Lin
>

8106. Re: Steps/sweep in V116 RevD

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-28 14:32:16 UTC
From: Sam
Topic: 8102 Message: 8106

Lin,
The software does limit the number of steps, but the limit is huge--something like 40,000. I used a large number of steps to do a scan for spurs, and I had to let the scan run for hours. Even simple things like Redrawing the graph become painfully slow when you get beyond a few thousand steps. I typically run with 200-400 steps, and almost never need more than 1000.

I believe the size of calibration files is limited to 2000 steps because file processing becomes very slow above that. I have just now put in a warning if the number of steps is specified above that level. That will at least protect against someone accidentally adding an extra "0".

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Scotty
> You are right. I did not wait enough time. After I wait about 40 seconds, it is ready to sweep. Maybe we can put a reminder somewhere, if the number is above 5000.
> Thanks
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> >
> > Hi Lin,
> > Are you sure it really stopped running? On my computer, 10,000 steps requires about one minute before the sweep will start scanning. It takes time to calculate all the steps and put the commanding information into the software arrays.
> > Scotty
> >
> > --- On Fri, 5/27/11, inlinebeginner <inlinebeginner@> wrote:
> >
> > From: inlinebeginner <inlinebeginner@>
> > Subject: [spectrumanalyzer] Steps/sweep in V116 RevD
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Friday, May 27, 2011, 9:18 PM
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> > Sam
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> > If I put a 10000 for Steps/sweep, the software will stop running. Maybe we need put a limit for this number.
> >
> > Lin
> >
>

8107. Re: Response difference with/without RFA_1 in TG mode

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-28 14:41:14 UTC
From: Sam
Topic: 8101 Message: 8107

Yes, the isolation amp is extremely effective. I think I ended up with a 25 dB improvement. I highly recommend it to anyone who wants to use the MSA with the TG below 1 MHz.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Lin,
> You are doing better than a 20 dB improvement. Your "with" trace is down in the mud and a good difference between the two traces cannot be made. However, I'm guessing you have about a 30 dB improvement. Good going.
> Scotty
>
> --- On Fri, 5/27/11, inlinebeginner <inlinebeginner@...> wrote:
>
> From: inlinebeginner <inlinebeginner@...>
> Subject: [spectrumanalyzer] Response difference with/without RFA_1 in TG mode
> To: spectrumanalyzer@yahoogroups.com
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>
> The difference can be 20dB at 300kHz between with and with out RFA_1 in TG mode. I put a photo here:
>
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1019394296/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
>
>
>
> Lin

>

8108. Re: Steps/sweep in V116 RevD

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-28 16:55:25 UTC
From: Greg Broburg
Topic: 8102 Message: 8108

Hello Sam;

this issue of having to scan 40000 steps seems to me
to be not necessary in light of the fact that most people
have added wider band IF filters. My suggestion early
on was to make one filter a pass through of the 10M7
and use only the bandwidth of the first IF filter. This would
allow about 2 MHz window. Yes, I understand that we could
cook up a precise 1M0 filter at 10M7 and this would be
very nice. Obviously it would be an LCR. Or if somebody
has another favorite IF that would make a nice 1M0 BW
then lets hear about it.

Anyway the IF BW seems to me to be the big issue for
wide sweeps. A full BW sweep that takes an hour is not
useful it seems to me.

I know I am asking for some argument here but this
wideband IF idea for faster wide sweeps is a well known
issue among the big boys.

Regards;

Greg

Once you find where the action is then you
can go back and whittle it down to small steps.

On 5/28/2011 8:32 AM, Sam wrote:
>
> Lin,
> The software does limit the number of steps, but the limit is
> huge--something like 40,000. I used a large number of steps to do a
> scan for spurs, and I had to let the scan run for hours. Even simple
> things like Redrawing the graph become painfully slow when you get
> beyond a few thousand steps. I typically run with 200-400 steps, and
> almost never need more than 1000.
>
> I believe the size of calibration files is limited to 2000 steps
> because file processing becomes very slow above that. I have just now
> put in a warning if the number of steps is specified above that level.
> That will at least protect against someone accidentally adding an
> extra "0".
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com

> <mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner"
> <inlinebeginner@...> wrote:
> >
> > Scotty
> > You are right. I did not wait enough time. After I wait about 40
> seconds, it is ready to sweep. Maybe we can put a reminder somewhere,
> if the number is above 5000.
> > Thanks
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, william sprowls
> <wsprowls@> wrote:
> > >
> > > Hi Lin,
> > > Are you sure it really stopped running? On my computer, 10,000
> steps requires about one minute before the sweep will start scanning.
> It takes time to calculate all the steps and put the commanding
> information into the software arrays.
> > > Scotty
> > >
> > > --- On Fri, 5/27/11, inlinebeginner <inlinebeginner@> wrote:
> > >
> > > From: inlinebeginner <inlinebeginner@>
> > > Subject: [spectrumanalyzer] Steps/sweep in V116 RevD
> > > To: spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>
> > > Date: Friday, May 27, 2011, 9:18 PM
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> > > Sam
> > >
> > > If I put a 10000 for Steps/sweep, the software will stop running.
> Maybe we need put a limit for this number.
> > >

> > > Lin
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8109. Re: [spectrumanalyzer] Re: Steps/sweep in V116 RevD

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-28 16:33:58 UTC
From: william sprowls
Topic: 8102 Message: 8109

Hi Greg,
 Don't worry about arguments being raised. It is just the law of physics that sweep speed and resolution bandwidth are interdependent. For the MSA, the real sweep speed limitation is Liberty Basic. Back when I first chose LB as the software platform, computer processor speeds were less than 600 MHz and LPT bus speeds were 1 MHz. These determined the limitation of the MSA sweep speed.
 Well, times have changed and computer speeds are growing at an exponential rate. Now, the main speed limitation is the speed at which LB can "paint" the monitor. It is really a suckingly slow process that the LB programmers are not too concerned with. Their speed priorities are concentrated in other areas of their software. Their graphics probably have to go through several subprogram modules to finally get to the MicroSoft screen format.
 I'm no computer wizard, but that's my observation.
Scotty
--- On Sat, 5/28/11, Greg Broburg <semiflex@...> wrote:

From: Greg Broburg <semiflex@...>
Subject: [spectrumanalyzer] Re: Steps/sweep in V116 RevD
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, May 28, 2011, 11:55 AM

Hello Sam;

this issue of having to scan 40000 steps seems to me

to be not necessary in light of the fact that most people

have added wider band IF filters. My suggestion early

on was to make one filter a pass through of the 10M7

and use only the bandwidth of the first IF filter. This would

allow about 2 MHz window. Yes, I understand that we could

cook up a precise 1M0 filter at 10M7 and this would be

very nice. Obviously it would be an LCR. Or if somebody

has another favorite IF that would make a nice 1M0 BW

then lets hear about it.

Anyway the IF BW seems to me to be the big issue for

wide sweeps. A full BW sweep that takes an hour is not

useful it seems to me.

I know I am asking for some argument here but this

wideband IF idea for faster wide sweeps is a well known

issue among the big boys.

Regards;

Greg

Once you find where the action is then you

can go back and whittle it down to small steps.

On 5/28/2011 8:32 AM, Sam wrote:

Lin,

The software does limit the number of steps, but the limit is huge--something like 40,000. I used a large number of steps to do a scan for spurs, and I had to let the scan run for hours. Even simple things like Redrawing the graph become painfully slow when you get beyond a few thousand steps. I typically run with 200-400 steps, and almost never need more than 1000.

I believe the size of calibration files is limited to 2000 steps because file processing becomes very slow above that. I have just now put in a warning if the number of steps is specified above that level. That will at least protect against someone accidentally adding an extra "0".

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:

>

> Scotty

> You are right. I did not wait enough time. After I wait about 40 seconds, it is ready to sweep. Maybe we can put a reminder somewhere, if the number is above 5000.

> Thanks

> Lin

>

> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:

> >

> > Hi Lin,

> > Are you sure it really stopped running? On my computer, 10,000 steps requires about one minute before the sweep will start scanning. It takes time to calculate all the steps and put the commanding information into the software arrays.

> > Scotty

> >

> > --- On Fri, 5/27/11, inlinebeginner <inlinebeginner@> wrote:

> >

> > From: inlinebeginner <inlinebeginner@>

> > Subject: [spectrumanalyzer] Steps/sweep in V116 RevD

> > To: spectrumanalyzer@yahoogroups.com

> > Date: Friday, May 27, 2011, 9:18 PM

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> > Lin

> >

>

8110. Re: Steps/sweep in V116 RevD

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-28 18:48:20 UTC
From: Sam
Topic: 8102 Message: 8110

True, there may be no need for 40000 steps when you have a wide RBW. Way back when I did that, I had only a narrow filter. And I used a strong video filter and lots of wait time because I was looking for spurs that were almost in the noise. That's why the scan took so long.

You certainly could make a 2 MHz or so RBW by having one path bypass the IF2 filters, but there may be some Mixer 2 products that you would want to get rid of.

It's a pretty simple matter to make a 400 kHz RBW with ceramic filters, which is what I am using for my widest filter. That would let you scan a 400 MHz range with roughly 1000 points. With no wait time added, that would probably take about 7 seconds on a mid-range PC.

For people like me who use the Expanded Log Detector, the RBW has to fit within the passband of the final noise filter, which complicates the use of very wide filters, since a very wide RBW would require even a wider noise filter.

While LB purports to have a compiler, it is really just a tokenizer so the final program runs through an interpreter. That is ultimately the source of the speed issues.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
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> Hi Greg,
> Â Don't worry about arguments being raised. It is just the law of physics that sweep speed and resolution bandwidth are interdependent. For the MSA, the real sweep speed limitation is Liberty Basic. Back when I first chose LB as the software platform, computer processor speeds were less than 600 MHz and LPT bus speeds were 1 MHz. These determined the limitation of the MSA sweep speed.
> Â Well, times have changed and computer speeds are growing at an exponential rate. Now, the main speed limitation is the speed at which LB can "paint" the monitor. It is really a suckingly slow process that the LB programmers are not too concerned with. Their speed priorities are concentrated in other areas of their software. Their graphics probably have to go through several subprogram modules to finally get to the MicroSoft screen format.
> Â I'm no computer wizard, but that's my observation.
> Scotty
> --- On Sat, 5/28/11, Greg Broburg <semiflex@...> wrote:
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> From: Greg Broburg <semiflex@...>
> Subject: [spectrumanalyzer] Re: Steps/sweep in V116 RevD
> To: spectrumanalyzer@yahoogroups.com
> Date: Saturday, May 28, 2011, 11:55 AM
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> > Hello Sam;
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> this issue of having to scan 40000 steps seems to me
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> have added wider band IF filters. My suggestion early
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> very nice. Obviously it would be an LCR. Or if somebody
> has another favorite IF that would make a nice 1M0 BW
> then lets hear about it.
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> Anyway the IF BW seems to me to be the big issue for
> wide sweeps. A full BW sweep that takes an hour is not
> useful it seems to me.
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> I know I am asking for some argument here but this
> wideband IF idea for faster wide sweeps is a well known
> issue among the big boys.
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> Regards;
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> Greg
>

8111. Re: Steps/sweep in V116 RevD

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-28 23:22:53 UTC
From: Greg Broburg
Topic: 8102 Message: 8111

Hello Sam;

ok, so why not use two detectors, one fast detector and the expanded Log detector. the goal is to find signals with the fast detector and then to slow down the analysis to feed the expanded log detector when you find something. I know that there are issues if the signals are very small however in my experience looking for small signals means knowing where they are ahead of time so you can limit the sweep range to find the stuff that is buried in the noise.

Regards;

Greg

On 5/28/2011 12:48 PM, Sam wrote:
>
> True, there may be no need for 40000 steps when you have a wide RBW.
> Way back when I did that, I had only a narrow filter. And I used a
> strong video filter and lots of wait time because I was looking for
> spurs that were almost in the noise. That's why the scan took so long.
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> You certainly could make a 2 MHz or so RBW by having one path bypass
> the IF2 filters, but there may be some Mixer 2 products that you would
> want to get rid of.
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> It's a pretty simple matter to make a 400 kHz RBW with ceramic
> filters, which is what I am using for my widest filter. That would let
> you scan a 400 MHz range with roughly 1000 points. With no wait time
> added, that would probably take about 7 seconds on a mid-range PC.
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> For people like me who use the Expanded Log Detector, the RBW has to
> fit within the passband of the final noise filter, which complicates
> the use of very wide filters, since a very wide RBW would require even
> a wider noise filter.
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> While LB purports to have a compiler, it is really just a tokenizer so
> the final program runs through an interpreter. That is ultimately the
> source of the speed issues.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, william sprowls
> <wsprowls@...> wrote:
> >

> > Hi Greg,
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> probably have to go through several subprogram modules to finally get
> to the MicroSoft screen format.
> > ? I'm no computer wizard, but that's my observation.
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> > Regards;
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> > Greg
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8112. Re: Steps/sweep in V116 RevD

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-28 23:13:05 UTC
From: Sam
Topic: 8102 Message: 8112

The expanded log detector is not necessarily slow, it just is a step more complicated to give it a very wide bandwidth. Presently, I have a switched noise filter with two different filters; I would have to add a third of very wide bandwidth. Or, I would have to replace my current wide noise filter (about 1 MHz) with a wider one. That would not be hard, as the noise filter only needs to be about 30-40 dB deep. As a practical matter, though, I do mostly VNA work and my SA work is normally not wide-spectrum, so I'm good with 400 kHz as my widest filter. In fact, I don't have much use for a filter that wide. My main use for very wide spectrum SA would be examining a signal with harmonics, and you can easily show harmonics without using a large number of points.

But if someone can benefit from an ultra-wide RBW, it might be that a 2 MHz not-so-deep filter would do the trick, because the main objective would be to rely mostly on the cavity filter but reject any junk from Mixer 2.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Greg Broburg <semiflex@...> wrote:
>
> Hello Sam;
>
> ok, so why not use two detectors, one fast detector and the
> expanded Log detector. the goal is to find signals with the
> fast detector and then to slow down the analysis to feed
> the expanded log detector when you find something. I know
> that there are issues if the signals are very small however
> in my experience looking for small signals means knowing
> where they are ahead of time so you can limit the sweep
> range to find the stuff that is buried in the noise.
>
> Regards;
>
> Greg
>
> On 5/28/2011 12:48 PM, Sam wrote:
> >
> > True, there may be no need for 40000 steps when you have a wide RBW.
> > Way back when I did that, I had only a narrow filter. And I used a
> > strong video filter and lots of wait time because I was looking for
> > spurs that were almost in the noise. That's why the scan took so long.
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> > You certainly could make a 2 MHz or so RBW by having one path bypass
> > the IF2 filters, but there may be some Mixer 2 products that you would
> > want to get rid of.
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> > filters, which is what I am using for my widest filter. That would let

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> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, william sprowls
> > <wsprowls@> wrote:
> > >
> > > Hi Greg,
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> > > Â I'm no computer wizard, but that's my observation.
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> > > --- On Sat, 5/28/11, Greg Broburg <semiflex@> wrote:
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> > > From: Greg Broburg <semiflex@>
> > > Subject: [spectrumanalyzer] Re: Steps/sweep in V116 RevD
> > > To: spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
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> > > Regards;
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> > > Greg
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8113. Harmonic mixing

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-28 23:45:55 UTC
From: Sam
Topic: 8113 Message: 8113

I was curious about how well the MSA could detect a very high frequency signal using harmonic mixing, so I bought a $25 "oscillator" on eBay that covered 5-6 GHz, or some such range. Unfortunately, I think it was actually a tunable filter, so I was out of luck.

If anyone has a stable high-frequency signal source, it would be interesting to see if the MSA can detect it. This would require figuring out what frequency to tune the MSA to such that a harmonic of LO1 would have the proper relationship to the signal. Even if there is a net 50 dB conversion loss at the signal frequency, there should be some usable range there.

Sam W.

8114. Re: Steps/sweep in V116 RevD

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-29 00:55:08 UTC
From: Greg Broburg
Topic: 8102 Message: 8114

Excellent idea Sam.

Now for my lost passion it would be nice to be able
to do with an RF analyzer what Bruel and Kjaer
did with audio analyzers many moons ago.

That is to be able to set up special sweep to
receive concepts such as to sweep the TG at the
usual programmed value and to sweep the analyzer
at 2F or 3F or 4F or 5F. Yes that means that at 5F
you will only get to 200 MHz as the top of the analysis.

Also, the idea of fixing the TG at one frequency and
sweeping the band up to 1G then to move the TG
and do it again in order to study the harmonic relationships.
B&K developed the concept of a Fourier Transform of the
recovered harmonics referred to as the Cepstrum
(Twisted spelling of Spectrum)

The mechanical analysis folks are using the Cepstrum
concept in some applications. You dont really know what
you can do until you see what comes back on the screen.

Best Regards;

Greg

On 5/28/2011 5:13 PM, Sam wrote:
>
> The expanded log detector is not necessarily slow, it just is a step
> more complicated to give it a very wide bandwidth. Presently, I have a
> switched noise filter with two different filters; I would have to add
> a third of very wide bandwidth. Or, I would have to replace my current
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> But if someone can benefit from an ultra-wide RBW, it might be that a
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> > > > --- On Sat, 5/28/11, Greg Broburg <semiflex@> wrote:
> > > >
> > > > From: Greg Broburg <semiflex@>
> > > > Subject: [spectrumanalyzer] Re: Steps/sweep in V116 RevD
> > > > To: spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>
> > > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > Date: Saturday, May 28, 2011, 11:55 AM
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8115. My new version with enclosures

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-29 00:39:18 UTC
From: taishan_ma
Topic: 8115 Message: 8115

Based on the comments, I have done some modifications on these boards, and some tests have also been performed.

I have put them here: http://www.qsl.net/bg6khc/my_version2.htm .

Anyone can give me some more advices? Thanks in advance.

BG6KHC

8116. MSA measurement fidelity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-29 03:38:02 UTC
From: inlinebeginner
Topic: 8116 Message: 8116

How accurate the MSA could be comparing to the commercial equipment?
Here is a 10.7MHz RBW filter test result comparison between MSA TG mode and HP8753ES

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/643419936/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc

The two curves are almost the same above HP8753ES noise floor. However, below the HP8753ES noise floor, the MSA has better testability. This is because of its better noise floor.

Lin

8117. Re: [spectrumanalyzer] MSA measurement fidelity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-29 13:43:32 UTC
From: william sprowls
Topic: 8116 Message: 8117

Hi Lin,
 We couldn't ask for a better testimonial. I'm guessing your MSA's Resolution Filter is much narrower than the HP's.
 Your comparison really shows the accuracy of your Magnitude calibration. Well done!
Scotty

--- On Sat, 5/28/11, inlinebeginner <inlinebeginner@...> wrote:

From: inlinebeginner <inlinebeginner@...>
Subject: [spectrumanalyzer] MSA measurement fidelity
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, May 28, 2011, 10:38 PM

How accurate the MSA could be comparing to the commercial equipment?

Here is a 10.7MHz RBW filter test result comparison between MSA TG mode and HP8753ES

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/643419936/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc

The two curves are almost the same above HP8753ES noise floor. However, below the HP8753ES noise floor, the MSA has better testability. This is because of its better noise floor.

Lin

8118. Re: MSA measurement fidelity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-29 14:22:37 UTC
From: Sam
Topic: 8116 Message: 8118

What were the RBW settings for the two VNAs? I'm curious as to how much that created the better noise floor for the MSA, and how much was due to other factors.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Lin,
> Â We couldn't ask for a better testimonial. I'm guessing your MSA's Resolution Filter is much narrower than the HP's.
> Â Your comparison really shows the accuracy of your Magnitude calibration. Well done!
> Scotty
>
> --- On Sat, 5/28/11, inlinebeginner <inlinebeginner@...> wrote:
>
> From: inlinebeginner <inlinebeginner@...>
> Subject: [spectrumanalyzer] MSA measurement fidelity
> To: spectrumanalyzer@yahoogroups.com
> Date: Saturday, May 28, 2011, 10:38 PM
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>
> The two curves are almost the same above HP8753ES noise floor. However, below the HP8753ES noise floor, the MSA has better testability. This is because of its better noise floor.
>
>
>
> Lin
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8119. Re: MSA measurement fidelity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-29 19:01:15 UTC
From: inlinebeginner
Topic: 8116 Message: 8119

MSA RBW 1kHz, HP8753ES RBW might be wider, I could not see the settings.
Lin
--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> What were the RBW settings for the two VNAs? I'm curious as to how much that created the better noise floor for the MSA, and how much was due to other factors.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
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> > Scotty
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> > --- On Sat, 5/28/11, inlinebeginner <inlinebeginner@> wrote:
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> > From: inlinebeginner <inlinebeginner@>
> > Subject: [spectrumanalyzer] MSA measurement fidelity
> > To: spectrumanalyzer@yahoogroups.com
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> > The two curves are almost the same above HP8753ES noise floor. However, below the HP8753ES noise floor, the MSA has better testability. This is because of its better noise floor.
> >
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> >
> > Lin
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8120. Re: MSA measurement fidelity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-29 19:40:00 UTC
From: Sam
Topic: 8116 Message: 8120

For what it's worth, I found an HP8753ES data sheet that specifies the typical noise level as -110 dBm, with a 10 Hz BW (that's Hz, not kHz). At 3 kHz BW, the max noise is specified as -82 dBm.

Assuming your MSA TG is -8 dBm, your noise level appears to be -110 dBm with a 1 KHz BW. So your MSA is matching the 8753's best, and your MSA bandwidth is 100 times what the 8753 requires to meet that noise level. My guess is that in this particular scan, the 8753 BW is 3 kHz, so it has 3 times your MSA BW but 30 times as much noise.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> MSA RBW 1kHz, HP8753ES RBW might be wider, I could not see the settings.
> Lin
> --- In spectrumanalyzer@...m, "Sam" <swetterlin@> wrote:
> >
> > What were the RBW settings for the two VNAs? I'm curious as to how much that created the better noise floor for the MSA, and how much was due to other factors.
> > Sam W.
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> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
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> > > Hi Lin,
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> > > Â Your comparison really shows the accuracy of your Magnitude calibration. Well done!
> > > Scotty
> > >
> > > --- On Sat, 5/28/11, inlinebeginner <inlinebeginner@> wrote:
> > >
> > > From: inlinebeginner <inlinebeginner@>
> > > Subject: [spectrumanalyzer] MSA measurement fidelity
> > > To: spectrumanalyzer@yahoogroups.com
> > > Date: Saturday, May 28, 2011, 10:38 PM

> > > How accurate the MSA could be comparing to the commercial equipment?
> > >
> > > Here is a 10.7MHz RBW filter test result comparison between MSA TG mode and HP8753ES
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> > >
> > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/643419936/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
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> > > The two curves are almost the same above HP8753ES noise floor. However, below the HP8753ES noise floor, the MSA has better testability. This is because of its better noise floor.
> > >
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> > > Lin
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8121. Re: MSA measurement fidelity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-30 13:26:26 UTC
From: inlinebeginner
Topic: 8116 Message: 8121

Sam
That is true, my MSA noise floor with 1kHz filter is -110dBm.
I think if I increase the power level on HP, I may get better result.
For the higher frequency, I post a new verification test result here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1041862394/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc

The bump arond 580MHz can be a little bit better (maybe 5dB) if I put 6dB attenuator both at TG output and SA input.I could not find why it has that problem.Maybe the TG driving level is too low or some reflection? My MSA RBW is 1kHz.

Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> For what it's worth, I found an HP8753ES data sheet that specifies the typical noise level as -110 dBm, with a 10 Hz BW (that's Hz, not kHz). At 3 kHz BW, the max noise is specified as -82 dBm.
>
> Assuming your MSA TG is -8 dBm, your noise level appears to be -110 dBm with a 1 KHz BW. So your MSA is matching the 8753's best, and your MSA bandwidth is 100 times what the 8753 requires to meet that noise level. My guess is that in this particular scan, the 8753 BW is 3 kHz, so it has 3 times your MSA BW but 30 times as much noise.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > MSA RBW 1kHz, HP8753ES RBW might be wider, I could not see the settings.
> > Lin
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > What were the RBW settings for the two VNAs? I'm curious as to how much that created the better noise floor for the MSA, and how much was due to other factors.
> > > Sam W.
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> > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > > >
> > > > Hi Lin,
> > > > Â We couldn't ask for a better testimonial. I'm guessing your MSA's Resolution Filter is much narrower than the HP's.
> > > > Â Your comparison really shows the accuracy of your Magnitude calibration. Well done!
> > > > Scotty
> > > >
> > > > --- On Sat, 5/28/11, inlinebeginner <inlinebeginner@> wrote:

> > > >
> > > > From: inlinebeginner <inlinebeginner@>
> > > > Subject: [spectrumanalyzer] MSA measurement fidelity
> > > > To: spectrumanalyzer@yahoogroups.com
> > > > Date: Saturday, May 28, 2011, 10:38 PM
>
> > > > How accurate the MSA could be comparing to the commercial equipment?
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> > > > Here is a 10.7MHz RBW filter test result comparison between MSA TG mode and HP8753ES
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> > > >
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> > > > The two curves are almost the same above HP8753ES noise floor. However, below the HP8753ES noise floor, the MSA has better testability. This is because of its better noise floor.
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> > > > Lin
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8122. Re: [spectrumanalyzer] Re: MSA measurement fidelity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-30 14:23:47 UTC
From: william sprowls
Topic: 8116 Message: 8122

Hi Lin,
The very high MSA levels below 700 MHz are due to the high frequency products created in Mixer 3 (TG). If you place a low pass filter between the TG output and your UUT filter, those levels should be much lower. Try about a 900 MHz LPF.
Scotty

--- On Mon, 5/30/11, inlinebeginner <inlinebeginner@...> wrote:

From: inlinebeginner <inlinebeginner@...>
Subject: [spectrumanalyzer] Re: MSA measurement fidelity
To: spectrumanalyzer@yahoogroups.com
Date: Monday, May 30, 2011, 8:26 AM

Sam

That is true, my MSA noise floor with 1kHz filter is -110dBm.

I think if I increase the power level on HP, I may get better result.

For the higher frequency, I post a new verification test result here:

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1041862394/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc

The bump arond 580MHz can be a little bit better (maybe 5dB) if I put 6dB attenuator both at TG output and SA input.I could not find why it has that problem.Maybe the TG driving level is too low or some reflection? My MSA RBW is 1kHz.

Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:

>

> For what it's worth, I found an HP8753ES data sheet that specifies the typical noise level as -110 dBm, with a 10 Hz BW (that's Hz, not kHz). At 3 kHz BW, the max noise is specified as -82 dBm.

>

> Assuming your MSA TG is -8 dBm, your noise level appears to be -110 dBm with a 1 KHz BW. So your MSA is matching the 8753's best, and your MSA bandwidth is 100 times what the 8753 requires to meet that noise level. My guess is that in this particular scan, the 8753 BW is 3 kHz, so it has 3 times your MSA BW but 30 times as much noise.

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> Sam W.

>

> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:

> >

> > MSA RBW 1kHz, HP8753ES RBW might be wider, I could not see the settings.

> > Lin

> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:

> > >

> > > What were the RBW settings for the two VNAs? I'm curious as to how much that created the better noise floor for the MSA, and how much was due to other factors.

> > > Sam W.

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> > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:

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> > > > Scotty

> > > >

> > > > --- On Sat, 5/28/11, inlinebeginner <inlinebeginner@> wrote:

> > > >

> > > > From: inlinebeginner <inlinebeginner@>

> > > > Subject: [spectrumanalyzer] MSA measurement fidelity

> > > > To: spectrumanalyzer@yahoogroups.com

> > > > Date: Saturday, May 28, 2011, 10:38 PM

>

> > > > How accurate the MSA could be comparing to the commercial equipment?

> > > >

> > > > Here is a 10.7MHz RBW filter test result comparison between MSA TG mode and HP8753ES

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> > > > Lin

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8123. Re: MSA measurement fidelity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-30 14:41:03 UTC
From: Sam
Topic: 8116 Message: 8123

That stuff between 500 and 700 MHz definitely should not be there. To some extent, it could be the result of high frequency signals in the TG, but I'm surprised it covers such a broad range. It is somewhat erratic, like noise, but doesn't seem erratic enough to actually be noise.

Try scanning 1-1000 MHz and see how things look at lower frequencies. Also try an uncalibrated scan of the TG to see how it looks (select None under menu Operating Cal->Reference To). That will show whether the TG loses power. Another way to check the TG is just to watch the scan that occurs while you do the Through calibration; that scan shows the raw TG response, which may have some waviness but should not have any dramatic dips.

Finally, if this is the result of >1GHz signals in the TG, you can eliminate it with a LPF on the TG.

The fact that the attenuators reduce the 580 MHz bump (but apparently not the area around the bump) suggests that the DUT has (1) some change in reflection of IF1 that comes out of MSA input or (2) some change in reflection of LO2 and/or LO3 coming out of the TG output. The LPF would also eliminate these effects.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> That is true, my MSA noise floor with 1kHz filter is -110dBm.
> I think if I increase the power level on HP, I may get better result.
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>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > Sam W.
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> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
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> > > > > --- On Sat, 5/28/11, inlinebeginner <inlinebeginner@> wrote:
> > > > > >
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> > > > > To: spectrumanalyzer@yahoogroups.com
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> > > > > Lin
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8124. Re: MSA measurement fidelity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-30 14:56:06 UTC
From: Sam
Topic: 8116 Message: 8124

Try the LPF first. I always run with a LPF unless I have a particular interest in the area close to 1 GHz. Note that in Transmission mode, calibration will automatically adjust for the TG dropoff caused by the LPF, but the weaker TG will reduce the dynamic range a bit. For your scan, the DUT response is high near 1 GHz, so the LPF will do no harm at all.

If you are in SA+TG mode, the declining TG will be superimposed on the DUT response unless you use a Reference line created with a Through scan and specify to subtract the Reference line from the data.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> That stuff between 500 and 700 MHz definitely should not be there. To some extent, it could be the result of high frequency signals in the TG, but I'm surprised it covers such a broad range. It is somewhat erratic, like noise, but doesn't seem erratic enough to actually be noise.
>
> Try scanning 1-1000 MHz and see how things look at lower frequencies. Also try an uncalibrated scan of the TG to see how it looks (select None under menu Operating Cal->Reference To). That will show whether the TG loses power. Another way to check the TG is just to watch the scan that occurs while you do the Through calibration; that scan shows the raw TG response, which may have some waviness but should not have any dramatic dips.
>
> Finally, if this is the result of >1GHz signals in the TG, you can eliminate it with a LPF on the TG.
>
> The fact that the attenuators reduce the 580 MHz bump (but apparently not the area around the bump) suggests that the DUT has (1) some change in reflection of IF1 that comes out of MSA input or (2) some change in reflection of LO2 and/or LO3 coming out of the TG output. The LPF would also eliminate these effects.
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> Sam W.
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> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Sam
> > That is true, my MSA noise floor with 1kHz filter is -110dBm.
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> > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1041862394/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
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> > The bump arond 580MHz can be a little bit better (maybe 5dB) if I put 6dB attenuator both at TG output and SA input.I could not find why it has that problem.Maybe the TG driving level is too low or some reflection? My MSA RBW is 1kHz.

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> > Lin
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> > > For what it's worth, I found an HP8753ES data sheet that specifies the typical noise level as -110 dBm, with a 10 Hz BW (that's Hz, not kHz). At 3 kHz BW, the max noise is specified as -82 dBm.
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> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > >
> > > > MSA RBW 1kHz, HP8753ES RBW might be wider, I could not see the settings.
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> > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > > > > What were the RBW settings for the two VNAs? I'm curious as to how much that created the better noise floor for the MSA, and how much was due to other factors.
> > > > > Sam W.
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> > > > > > --- On Sat, 5/28/11, inlinebeginner <inlinebeginner@> wrote:
> > > > > >
> > > > > > From: inlinebeginner <inlinebeginner@>
> > > > > > Subject: [spectrumanalyzer] MSA measurement fidelity
> > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > Date: Saturday, May 28, 2011, 10:38 PM
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> > > > > >
> > > > > > Lin
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8126. Fine instruments, like multimeters, oscilloscope etc

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-31 11:14:23 UTC
From: Electroniclab66
Topic: 8126 Message: 8126

www.h-instruments.ecrater.com and www.h-instruments.ecrater.co.uk are selling cheap instruments and accessories.

8127. Cheap 2 layer prototype PCB boards - custom made

Yahoo group: spectrumanalyzer (2011)
Date: 2011-05-31 11:15:47 UTC
From: Electroniclab66
Topic: 8127 Message: 8127

Hi.
I found a producer of a cheap 2 layer pcb boards.
I did order for a project I was working on and the quality and service was very fine.
5 pcs of 2 layer board with silckscreen is 29.95$ for max size 50x50mm and 54.95$ for max size 100x100m. Both with free shipping.
See: www.h-instruments.com or www.h-instruments.ecrater.com (www.h-instruments.co.uk for UK)

Regards
John

8128. Re: MSA measurement fidelity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-01 00:19:46 UTC
From: inlinebeginner
Topic: 8116 Message: 8128

Scotty, Sam
The LPF solved the problem. Here is the result
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1495660066/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc

The reflection might be another reson, I put a 3dB attenuator between the DUT and LPF, it gets better.
Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Try the LPF first. I always run with a LPF unless I have a particular interest in the area close to 1 GHz. Note that in Transmission mode, calibration will automatically adjust for the TG dropoff caused by the LPF, but the weaker TG will reduce the dynamic range a bit. For your scan, the DUT response is high near 1 GHz, so the LPF will do no harm at all.
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> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > That stuff between 500 and 700 MHz definitely should not be there. To some extent, it could be the result of high frequency signals in the TG, but I'm surprised it covers such a broad range. It is somewhat erratic, like noise, but doesn't seem erratic enough to actually be noise.
> >
> > Try scanning 1-1000 MHz and see how things look at lower frequencies. Also try an uncalibrated scan of the TG to see how it looks (select None under menu Operating Cal->Reference To). That will show whether the TG loses power. Another way to check the TG is just to watch the scan that occurs while you do the Through calibration; that scan shows the raw TG response, which may have some waviness but should not have any dramatic dips.
> >
> > Finally, if this is the result of >1GHz signals in the TG, you can eliminate it with a LPF on the TG.
> >
> > The fact that the attenuators reduce the 580 MHz bump (but apparently not the area around the bump) suggests that the DUT has (1) some change in reflection of IF1 that comes out of MSA input or (2) some change in reflection of LO2 and/or LO3 coming out of the TG output. The LPF would also eliminate these effects.

> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > >
> > > Sam
> > > That is true, my MSA noise floor with 1kHz filter is -110dBm.
> > > I think if I increase the power level on HP, I may get better result.
> > > For the higher frequency, I post a new verification test result here:
> > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1041862394/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
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> > > The bump arond 580MHz can be a little bit better (maybe 5dB) if I put 6dB attenuator both at TG output and SA input.I could not find why it has that problem.Maybe the TG driving level is too low or some reflection? My MSA RBW is 1kHz.
> > >
> > > Lin
> > >
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> > > > For what it's worth, I found an HP8753ES data sheet that specifies the typical noise level as -110 dBm, with a 10 Hz BW (that's Hz, not kHz). At 3 kHz BW, the max noise is specified as -82 dBm.
> > > >
> > > > Assuming your MSA TG is -8 dBm, your noise level appears to be -110 dBm with a 1 KHz BW. So your MSA is matching the 8753's best, and your MSA bandwidth is 100 times what the 8753 requires to meet that noise level. My guess is that in this particular scan, the 8753 BW is 3 kHz, so it has 3 times your MSA BW but 30 times as much noise.
> > > >
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > >
> > > > > MSA RBW 1kHz, HP8753ES RBW might be wider, I could not see the settings.
> > > > > Lin
> > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > >
> > > > > > What were the RBW settings for the two VNAs? I'm curious as to how much that created the better noise floor for the MSA, and how much was due to other factors.
> > > > > > Sam W.
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > > > > > >
> > > > > > > Hi Lin,
> > > > > > > Â We couldn't ask for a better testimonial. I'm guessing your MSA's Resolution Filter is much narrower than the HP's.
> > > > > > > Â Your comparison really shows the accuracy of your Magnitude calibration. Well done!
> > > > > > > Scotty
> > > > > > >

> > > > > > > --- On Sat, 5/28/11, inlinebeginner <inlinebeginner@> wrote:
> > > > > > >
> > > > > > > > From: inlinebeginner <inlinebeginner@>
> > > > > > > > Subject: [spectrumanalyzer] MSA measurement fidelity
> > > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > > Date: Saturday, May 28, 2011, 10:38 PM
> > > > >
> > > > > > > > How accurate the MSA could be comparing to the commercial equipment?
> > > > > > > >
> > > > > > > > Here is a 10.7MHz RBW filter test result comparison between MSA TG mode and
HP8753ES
> > > > > > > >
> > > > > > > >
> > > > > > > >
> > > > > > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/64
3419936/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > > > >
> > > > > > > >
> > > > > > > >
> > > > > > > > The two curves are almost the same above HP8753ES noise floor. However, below
the HP8753ES noise floor, the MSA has better testability. This is because of its better
noise floor.
> > > > > > >
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> > > > > > > > Lin
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8129. Re: MSA measurement fidelity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-01 14:24:19 UTC
From: Sam
Topic: 8116 Message: 8129

Wow, that was effective.

I notice that there is still some residual ripple along the skirt. That is likely caused either by calibration error (seems unlikely since your 10.7 MHz graph was fine) or by one of these reflection effects:
(Note the ripple is outside the passband, where the filter is probably very reflective at input and output).)
1. TG signal hits DUT, a large portion reflects back to TG output. If TG output has high return loss, this reflection is absorbed; otherwise some of it re-reflects back to the DUT, where some share of it will pass through and either increase or decrease the net transmitted signal, depending on the phase of the reflection compared to the original TG signal.
2. Transmitted signal reaches MSA input, some of it reflects back to the DUT, and most of that reflection is re-reflected back to the MSA input. This also increases or decreases the reading depending on phase.
3. In calibration with the Through, some of the TG signal reaching the MSA input reflects back to the TG output, and re-reflects to the MSA input, increasing or decreasing the reading.

In all these cases, the reading increases or decreases depending on the phase of some reflection, which means it varies over frequency and therefore creates ripple. Also, in all these cases, the potentially troublesome reflection gets absorbed before causing trouble if the TG output and MSA input have high return losses. That is most easily accomplished with attenuators or buffer amps. This issue would also be dealt with by using more elaborate calibration than simple Through calibration.

Enabling such calibration is high on the list of desired software features. In the meantime, attenuators and/or buffer amps are the way to go. In my design of the LO2 isolation amp, there are two amps on the board, and the second is used as a buffer amp for the TG, which solves part of this problem.

It would be interesting to see how the graph looks with 10 dB attenuators on each side. Of course, you would lose the very bottom of the response, but the skirt should be more linear.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Scotty, Sam
> The LPF solved the problem. Here is the result
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1495660066/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
>
> The reflection might be another reson, I put a 3dB attenuator between the DUT and LPF, it gets better.

> Thanks
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Try the LPF first. I always run with a LPF unless I have a particular interest in the area close to 1 GHz. Note that in Transmission mode, calibration will automatically adjust for the TG dropoff caused by the LPF, but the weaker TG will reduce the dynamic range a bit. For your scan, the DUT response is high near 1 GHz, so the LPF will do no harm at all.
> >
> > If you are in SA+TG mode, the declining TG will be superimposed on the DUT response unless you use a Reference line created with a Through scan and specify to subtract the Reference line from the data.
> >
> > Sam W.
> >
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > That stuff between 500 and 700 MHz definitely should not be there. To some extent, it could be the result of high frequency signals in the TG, but I'm surprised it covers such a broad range. It is somewhat erratic, like noise, but doesn't seem erratic enough to actually be noise.
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> > > Try scanning 1-1000 MHz and see how things look at lower frequencies. Also try an uncalibrated scan of the TG to see how it looks (select None under menu Operating Cal->Reference To). That will show whether the TG loses power. Another way to check the TG is just to watch the scan that occurs while you do the Through calibration; that scan shows the raw TG response, which may have some waviness but should not have any dramatic dips.
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> > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1041862394/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
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> > > > Lin
> > > >
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> > > > > For what it's worth, I found an HP8753ES data sheet that specifies the typical noise level as -110 dBm, with a 10 Hz BW (that's Hz, not kHz). At 3 kHz BW, the max noise is specified as -82 dBm.
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> > > > > Assuming your MSA TG is -8 dBm, your noise level appears to be -110 dBm with a 1 KHz BW. So your MSA is matching the 8753's best, and your MSA bandwidth is 100 times what the 8753 requires to meet that noise level. My guess is that in this particular scan, the 8753 BW is 3 kHz, so it has 3 times your MSA BW but 30 times as much noise.
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> > > > > Sam W.
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> > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > >
> > > > > > MSA RBW 1kHz, HP8753ES RBW might be wider, I could not see the settings.
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> > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > > > > > > What were the RBW settings for the two VNAs? I'm curious as to how much that created the better noise floor for the MSA, and how much was due to other factors.
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> > > > > > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
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> > > > > > > > Hi Lin,
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> > > > > > > > Â Your comparison really shows the accuracy of your Magnitude calibration. Well done!
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> > > > > > > > --- On Sat, 5/28/11, inlinebeginner <inlinebeginner@> wrote:
> > > > > > > >
> > > > > > > > From: inlinebeginner <inlinebeginner@>
> > > > > > > > Subject: [spectrumanalyzer] MSA measurement fidelity
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> > > > > > > Here is a 10.7MHz RBW filter test result comparison between MSA TG mode and HP8753ES

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> > > > > > > > > Lin
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8130. unpopulated DDS board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-01 21:58:39 UTC
From: w4zcb77
Topic: 8130 Message: 8130

Anyone with a spare DDS board they want to donate or sell? Have friend, complete with a torn up DDS board that needs one to plant his 9851 on.

Advise on or off list.

Regards
W4ZCB

8131. Re: [spectrumanalyzer] unpopulated DDS board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-01 22:52:21 UTC
From: D. J. Wang
Topic: 8130 Message: 8131

I am looking for two of the same unpopulated DDS boards too.
Thanks!
NM3R

From: w4zcb77 <w4zcb@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Wed, June 1, 2011 5:58:39 PM
Subject: [spectrumanalyzer] unpopulated DDS board

Anyone with a spare DDS board they want to donate or sell? Have friend, complete with a torn up DDS board that needs one to plant his 9851 on.

Advise on or off list.

Regards
W4ZCB

8132. Re: [spectrumanalyzer] unpopulated DDS board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-02 00:20:02 UTC
From: w4zcb
Topic: 8130 Message: 8132

Me first! I would take a 1:1 print mask of an empty one and make one
for him, mine are all stuffed.

W4ZCB
----- Original Message -----
From: "D. J. Wang" <dj_wang@...>
To: <spectrumanalyzer@yahoogroups.com>
Sent: Wednesday, June 01, 2011 6:52 PM
Subject: Re: [spectrumanalyzer] unpopulated DDS board

I am looking for two of the same unpopulated DDS boards too.
Thanks!
NM3R

From: w4zcb77 <w4zcb@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Wed, June 1, 2011 5:58:39 PM
Subject: [spectrumanalyzer] unpopulated DDS board

Anyone with a spare DDS board they want to donate or sell? Have
friend, complete
with a torn up DDS board that needs one to plant his 9851 on.

Advise on or off list.

Regards
W4ZCB

8133. cavity filter test

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-03 05:49:57 UTC
From: lbastetti
Topic: 8133 Message: 8133

Dear Group,

could please somebody post a picture of the MSA screen with the test of the cavity filter , as described at paragraph S of Integration and "Verification Test Procedure for the MSA,Modularized Spectrum Analyzer" page ?
I'm not sure of the result , had problem with one faulty MMIC , so PLO2 and PLO1 are still not closed in tin box , I would prefer verify the functionality also of cavity filter before closing the oscillators .
Is mandatory to box oscillators before this test ? I know there could be interaction between unshielded oscillators .
I've browsed pictures , there are many cavity filter photos, but not found any of this test .
My configuration is MSA+TR+VNA .

thanks a lot

Ladislao

8134. USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-03 17:53:10 UTC
From: Eric Nystrom
Topic: 8134 Message: 8134

I was reviewing the archives and was wondering what the current status of the USB support is? The last major discussion seems to have been Jan - Feb, with a mention (April) that it is supported in 116 beta.

I also saw a reference to an off the shelf Cypress board that has a CY68013A on it,
but did not see a part number for this board. Can someone provide the part number?

Eric Nystrom

8135. Re: [spectrumanalyzer] USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-03 18:08:48 UTC
From: William Dillon
Topic: 8134 Message: 8135

There are a number of boards that would work. There isn't yet a SLIM "part number" for it.

But I will take this opportunity to mention that I had been working on a USB control board. It's been on the back burner for a while, but I thought maybe I'd use this post to link to the files to get people's opinions. The primary design criteria was to provide the same capability as the existing control board, but to separate each SLIM's connector. This would make the connectors going to the control board modular, just like the SLIMs. I don't like the inevitable rats nest that occurs with the current control board. Anyway, here they are:

http://alternet.us.com/wp-content/uploads/2011/06/USB-CB.zip

It bares noting that this is a very early draft. I'm bringing it to the group only to collect opinions.

- Will

On Jun 3, 2011, at 10:53 AM, Eric Nystrom wrote:

>
> I was reviewing the archives and was wondering what the current status
> of the USB support is? The last major discussion seems to have been Jan - Feb,
> with a mention (April) that it is supported in 116 beta.
>
> I also saw a reference to an off the shelf Cypress board that has a CY68013A on it,
> but did not see a part number for this board. Can someone provide the part number?
>
> Eric Nystrom
>
>
>

8136. Re: USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-03 18:17:07 UTC
From: Geoff
Topic: 8134 Message: 8136

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> I don't like the inevitable rats nest that occurs with the current control board. Anyway, here they are:
>

It may look like a rats nest but it is a good way of reducing crosstalk on the digital control lines.

Geoff

8137. Re: [spectrumanalyzer] USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-03 18:49:35 UTC
From: dave
Topic: 8134 Message: 8137

I sell a CY68013A board. It is not a Cypress board(I designed it). It is
the HSUSB board. All I/O pins are brought out to headers.
It is at <http://www.wb6dhw.com/For_Sale.html#HSUSB

Dave - WB6DHW
<http://wb6dhw.com>

On 6/3/2011 10:53 AM, Eric Nystrom wrote:
> I was reviewing the archives and was wondering what the current status
> of the USB support is? The last major discussion seems to have been Jan - Feb,
> with a mention (April) that it is supported in 116 beta.
>
> I also saw a reference to an off the shelf Cypress board that has a CY68013A
> on it,
> but did not see a part number for this board. Can someone provide the part number?
> Eric Nystrom
>
>
>

8138. Re: [spectrumanalyzer] USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-03 18:57:09 UTC
From: dave
Topic: 8134 Message: 8138

What program did you use to create the schematic and pcb files?

Dave - WB6DHW
<http://wb6dhw.com>

On 6/3/2011 11:08 AM, William Dillon wrote:
>
> There are a number of boards that would work. There isn't yet a SLIM "part
> number" for it.
>
>
> But I will take this opportunity to mention that I had been working on a USB
> control board. It's been on the back burner for a while, but I thought maybe
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> board, but to separate each SLIM's connector. This would make the connectors
> going to the control board modular, just like the SLIMs. I don't like the
> inevitable rats nest that occurs with the current control board. Anyway, here
> they are:
>
> http://alternet.us.com/wp-content/uploads/2011/06/USB-CB.zip
>
> It bares noting that this is a very early draft. I'm bringing it to the group
> only to collect opinions.
>
> - Will
>
> On Jun 3, 2011, at 10:53 AM, Eric Nystrom wrote:
>
>>
>> I was reviewing the archives and was wondering what the current status
>> of the USB support is? The last major discussion seems to have been Jan - Feb,
>> with a mention (April) that it is supported in 116 beta.
>>
>> I also saw a reference to an off the shelf Cypress board that has a CY68013A
>> on it,
>> but did not see a part number for this board. Can someone provide the part
>> number?
>> Eric Nystrom
>>
>>
>
>
>

8139. Re: [spectrumanalyzer] USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-03 19:01:20 UTC
From: William Dillon
Topic: 8134 Message: 8139

Cadsoft eagle

http://www.cadsoftusa.com/

The freeware version is all you need

On Jun 3, 2011, at 11:57 AM, dave wrote:

> What program did you use to create the schematic and pcb files?
>
> Dave - WB6DHW
> <http://wb6dhw.com>
>
> On 6/3/2011 11:08 AM, William Dillon wrote:
>
>>
>> There are a number of boards that would work. There isn't yet a SLIM "part number" for it.
>>
>>
>> But I will take this opportunity to mention that I had been working on a USB control board. It's been on the back burner for a while, but I thought maybe I'd use this post to link to the files to get people's opinions. The primary design criteria was to provide the same capability as the existing control board, but to separate each SLIM's connector. This would make the connectors going to the control board modular, just like the SLIMs. I don't like the inevitable rats nest that occurs with the current control board. Anyway, here they are:
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>> http://alternet.us.com/wp-content/uploads/2011/06/USB-CB.zip
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>> - Will
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>> On Jun 3, 2011, at 10:53 AM, Eric Nystrom wrote:
>>
>>>
>>>
>>> I was reviewing the archives and was wondering what the current status
>>> of the USB support is? The last major discussion seems to have been Jan - Feb,
>>> with a mention (April) that it is supported in 116 beta.
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>>> but did not see a part number for this board. Can someone provide the part number?
>>>

```
>>> Eric Nystrom
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8140. Re: USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-03 20:07:59 UTC
From: david529007
Topic: 8134 Message: 8140

The basic software is complete and works but I have been waiting to complete my own MSA in order to complete debugging.

It should run with any of the FX2LP boards. If you want to drive the current parallel port slim then you may use any of the chip options from the 56 pin upwards. If you want to replace the slim-cb then use a 100 or 133 pin version of the chip.

Completed drivers for the boards exist - there are two driver versions, one for driving slim-cb one for no slim-cb. All drivers have been signed by Ivan (thanks Ivan). Drivers are available for XP, Vista and Windows 7 in 32 and 64 bit versions.

The only programming needed is to put the 8 byte ID string into the eeprom on the usb controller. To do this, a program called 'usb configure' has been produced. Drivers are loaded dynamically evey time the board is plugged in so they do not need programming onto the hardware.

A DLL has been produced that interfaces between the hardware and the GUI application. This codes around limitations of liberty basic.

Code to drive the hardware has been added to the GUI.

If anyone wants to try it I have started to modify myVNA to drive the MSA hardware - a version that does (limited) spectrum analyser support is available but only drives the USB interface option. I will get back to this once I have working hardware of my own.

Dave

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> I was reviewing the archives and was wondering what the current status
> of the USB support is? The last major discussion seems to have been Jan - Feb,
> with a mention (April) that it is supported in 116 beta.
>
> I also saw a reference to an off the shelf Cypress board that has a CY68013A on
> it,
> but did not see a part number for this board. Can someone provide the part
> number?
>
> Eric Nystrom
>

8141. Re: cavity filter test

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-03 21:04:42 UTC
From: Sam
Topic: 8133 Message: 8141

I have posted a photo of my cavity filter test results in the SamW photo album. For some unknown reason, I get a small dimple at exactly 0 Hz when using small RBW, but it seems to be an artifact of this special test only, and does not appear in actual operation.

You can do a lot of testing without sealing the boards, but you may get extra spurs. I would recommend you at least put the side fencing in place; with 3/8" fence that projects a little below the board (so you can solder it to the bottom), it projects only about 1/4" above the top and does not get in the way of modifications. You may have to seal mixers 1 and 2 to get a good read on the ultimate attenuation of your cavity filter, to prevent through-the-air leakage from mixer 1 to mixer 2, but it may be sufficient to just tack the covers in place.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "lbastetti" <lbastetti001@...> wrote:
>
> Dear Group,
>
> could please somebody post a picture of the MSA screen with the test of the cavity filter , as described at paragraph S of Integration and "Verification Test Procedure for the MSA,Modularized Spectrum Analyzer" page ?
> I'm not sure of the result , had problem with one faulty MMIC , so PLO2 and PLO1 are still not closed in tin box , I would prefer verify the functionality also of cavity filter before closing the oscillators .
> Is mandatory to box oscillators before this test ? I know there could be interaction between unshielded oscillators .
> I've browsed pictures , there are many cavity filter photos, but not found any of this test .
> My configuration is MSA+TR+VNA .
>
> thanks a lot
>
> Ladislao
>

8142. Re: [spectrumanalyzer] Re: cavity filter test

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-04 03:44:09 UTC
From: william sprowls
Topic: 8133 Message: 8142

Hi Sam,
 That "dimple" you see at the center of the response (at "0" Hz) is an interference that I haven't quite figured out yet. It exists only during this test. Since we are more concerned with what the skirts look like, the "dimple" is just a nuisance.
Scotty

--- On Fri, 6/3/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: cavity filter test
To: spectrumanalyzer@yahoogroups.com
Date: Friday, June 3, 2011, 4:04 PM

I have posted a photo of my cavity filter test results in the SamW photo album. For some unknown reason, I get a small dimple at exactly 0 Hz when using small RBW, but it seems to be an artifact of this special test only, and does not appear in actual operation.

You can do a lot of testing without sealing the boards, but you may get extra spurs. I would recommend you at least put the side fencing in place; with 3/8" fence that projects a little below the board (so you can solder it to the bottom), it projects only about 1/4" above the top and does not get in the way of modifications. You may have to seal mixers 1 and 2 to get a good read on the ultimate attenuation of your cavity filter, to prevent through-the-air leakage from mixer 1 to mixer 2, but it may be sufficient to just tack the covers in place.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "lbastetti" <lbastetti001@...> wrote:

>

> Dear Group,

>

> could please somebody post a picture of the MSA screen with the test of the cavity filter , as described at paragraph S of Integration and "Verification Test Procedure for the MSA,Modularized Spectrum Analyzer" page ?

> I'm not sure of the result , had problem with one faulty MMIC , so PLO2 and PLO1 are still not closed in tin box , I would prefer verify the functionality also of cavity filter before closing the oscillators .

> Is mandatory to box oscillators before this test ? I know there could be interaction between unshielded oscillators .

> I've browsed pictures , there are many cavity filter photos, but not found any of this test .

> My configuration is MSA+TR+VNA .

>

> thanks a lot

>

> Ladislao

>

8143. Re: USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-04 04:22:33 UTC
From: Sam
Topic: 8134 Message: 8143

I am not set up to test the USB interface, but I understand from others that it works if you use USB to control the MSA through the control board. If you want to control the MSA modules directly, bypassing the control board, the driver is set up to do so but (1) you need a board with a Cypress chip with enough pins to do this and (2) there may be an issue regarding the Cypress running at 3.3V and the MSA running at 5V logic. The latter issue may be related to the need to drive 5 clock lines from one Cypress bit, which maybe is too much load on 3.3V logic when the receiving logic threshold is 2.5V.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "david529007" <dave.roberts@...> wrote:
>
>
> The basic software is complete and works but I have been waiting to complete my own MSA in order to complete debugging.
>
> It should run with any of the FX2LP boards. If you want to drive the current parallel port slim then you may use any of the chip options from the 56 pin upwards. If you want to replace the slim-cb then use a 100 or 133 pin version of the chip.
>
> Completed drivers for the boards exist - there are two driver versions, one for driving slim-cb one for no slim-cb. All drivers have been signed by Ivan (thanks Ivan). Drivers are available for XP, Vista and Windows 7 in 32 and 64 bit versions.
>
> The only programming needed is to put the 8 byte ID string into the eeprom on the usb controller. To do this, a program called 'usb configure' has been produced. Drivers are loaded dynamically evey time the board is plugged in so they do not need programming onto the hardware.
>
> A DLL has been produced that interfaces between the hardware and the GUI application. This codes around limitations of liberty basic.
>
> Code to drive the hardware has been added to the GUI.
>
> If anyone wants to try it I have started to modify myVNA to drive the MSA hardware - a version that does (limited) spectrum analyser support is available but only drives the USB interface option. I will get back to this once I have working hardware of my own.
>
> Dave
>
>
> --- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@> wrote:
> >
> > I was reviewing the archives and was wondering what the current status
> > of the USB support is? The last major discussion seems to have been Jan - Feb,

> > with a mention (April) that it is supported in 116 beta.
> >
> > I also saw a reference to an off the shelf Cypress board that has a CY68013A on
> > it,
> > but did not see a part number for this board. Can someone provide the part
> > number?
> >
> > Eric Nystrom
> >
>

8144. Re: [spectrumanalyzer] Re: cavity filter test

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-04 07:05:29 UTC
From: Ladislao Bastetti
Topic: 8133 Message: 8144

Thanks a lot

Ladislao

2011/6/3 Sam <swetterlin@...>

>
>
> I have posted a photo of my cavity filter test results in the SamW photo
> album. For some unknown reason, I get a small dimple at exactly 0 Hz when
> using small RBW, but it seems to be an artifact of this special test only,
> and does not appear in actual operation.
>
> You can do a lot of testing without sealing the boards, but you may get
> extra spurs. I would recommend you at least put the side fencing in place;
> with 3/8" fence that projects a little below the board (so you can solder it
> to the bottom), it projects only about 1/4" above the top and does not get
> in the way of modifications. You may have to seal mixers 1 and 2 to get a
> good read on the ultimate attenuation of your cavity filter, to prevent
> through-the-air leakage from mixer 1 to mixer 2, but it may be sufficient to
> just tack the covers in place.
>
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, "lbastetti" <lbastetti001@...>
> wrote:
> >
> > Dear Group,
> >
> > could please somebody post a picture of the MSA screen with the test of
> the cavity filter , as described at paragraph S of Integration and
> "Verification Test Procedure for the MSA,Modularized Spectrum Analyzer" page
> ?
> > I'm not sure of the result , had problem with one faulty MMIC , so PLO2
> and PLO1 are still not closed in tin box , I would prefer verify the
> functionality also of cavity filter before closing the oscillators .
> > Is mandatory to box oscillators before this test ? I know there could be
> interaction between unshielded oscillators .
> > I've browsed pictures , there are many cavity filter photos, but not
> found any of this test .
> > My configuration is MSA+TR+VNA .
> >
> > thanks a lot
> >
> > Ladislao

> >
>
>
>

8145. Re: [spectrumanalyzer] Re: USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-04 12:16:49 UTC
From: Jim Hontoria
Topic: 8134 Message: 8145

Hi all,

I have been running now on and off with pure USB interface.(no CB at all) I am preparing a detailed write up but in a nutshell this is my experience:

- The spectrumanalyzer software Version 116-4i commands the USB interface and I have not seen (or yet attempted to measure rather) any diffrernces with the CB. All the menu commands appear to work just fine. I am running everything on a Win 7-64 PC.. Dave Roberts wrote the USB code and provided drivers and utilities. And Sam Weterlin blended it into the spectrumanalyzer LB program.
Great job guys!

- Definitely you need the bigger Cypress 128-pin ICs because you need as a minimum four 8 bit ports for full functionality. The smaller Cypress IC don't have them.. Mine is a EZUSB FX2LP board that I got in EBay which includes a CY7C68013A 128-pin IC

. No soldering or any modification is requited. Unless you enjoy soldering 120-pi, closely spaced, this is the way to go.The board takes its power from the PC USB cable. Power for the SLIMs maybe derived from the CB or from Sam's power supply board (I use the later).

- I found that the CLK line gets overloaded by PLO3. I am working on a solution during this weekend.

- Finally: make sure that everything is working decently before you change over to USB: that way you can't blame the interface. I wasted a lot of time going back and forth because of this.

There are some finer points that i will be discussing in my forthcoming write up.

Jim, W1JGH

On Sat, Jun 4, 2011 at 12:22 AM, Sam <swetterlin@...> wrote:

>
>
> I am not set up to test the USB interface, but I understand from others
> that it works if you use USB to control the MSA through the control board.
> If you want to control the MSA modules directly, bypassing the control
> board, the driver is set up to do so but (1) you need a board with a Cypress
> chip with enough pins to do this and (2) there may be an issue regarding the
> Cypress running at 3.3V and the MSA running at 5V logic. The latter issue
> may be related to the need to drive 5 clock lines from one Cypress bit,
> which maybe is too much load on 3.3V logic when the receiving logic

> threshold is 2.5V.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "david529007" <dave.roberts@...>
> wrote:
> >
> >
> > The basic software is complete and works but I have been waiting to
> complete my own MSA in order to complete debugging.
> >
> > It should run with any of the FX2LP boards. If you want to drive the
> current parallel port slim then you may use any of the chip options from the
> 56 pin upwards. If you want to replace the slim-cb then use a 100 or 133 pin
> version of the chip.
> >
> > Completed drivers for the boards exist - there are two driver versions,
> one for driving slim-cb one for no slim-cb. All drivers have been signed by
> Ivan (thanks Ivan). Drivers are available for XP, Vista and Windows 7 in 32
> and 64 bit versions.
> >
> > The only programming needed is to put the 8 byte ID string into the
> eeprom on the usb controller. To do this, a program called 'usb configure'
> has been produced. Drivers are loaded dynamically evey time the board is
> plugged in so they do not need programming onto the hardware.
> >
> > A DLL has been produced that interfaces between the hardware and the GUI
> application. This codes around limitations of liberty basic.
> >
> > Code to drive the hardware has been added to the GUI.
> >
> > If anyone wants to try it I have started to modify myVNA to drive the MSA
> hardware - a version that does (limited) spectrum analyser support is
> available but only drives the USB interface option. I will get back to this
> once I have working hardware of my own.
> >
> > Dave
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@> wrote:
> > >
> > > I was reviewing the archives and was wondering what the current status
> > > of the USB support is? The last major discussion seems to have been Jan
> - Feb,
> > > with a mention (April) that it is supported in 116 beta.
> > >
> > > I also saw a reference to an off the shelf Cypress board that has a
> CY68013A on
> > > it,
> > > but did not see a part number for this board. Can someone provide the

> part
> > > number?
> > >
> > > Eric Nystrom
> > >
> >
>
>
>

--
Jim G. Hontoria

8146. Re: [spectrumanalyzer] Re: USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-04 12:53:18 UTC
From: Eric Nystrom
Topic: 8134 Message: 8146

Jim,

Thanks for the info. That helps a lot.

Is this the board on Ebay?

http://cgi.ebay.com/Cypress-CY7C68013A-EZ-USB-FX2LP-USB2-0-Develope-Board-/280535311982?pt=BI_Electrical_Equipment_Tools&hash=item415135266e

Eric Nystrom

From: Jim Hontoria <jghalpha@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Sat, June 4, 2011 8:16:49 AM
Subject: Re: [spectrumanalyzer] Re: USB Support Status

Hi all,

I have been running now on and off with pure USB interface.(no CB at all) I am preparing a detailed write up but in a nutshell this is my experience:

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Great job guys!

- Definitely you need the bigger Cypress 128-pin ICs because you need as a minimum four 8 bit ports for full functionality. The smaller Cypress IC don't have them.. Mine is a EZUSB FX2LP board that I got in EBay which includes a CY7C68013A 128-pin IC
. No soldering or any modification is requited. Unless you enjoy soldering 120-pi, closely spaced, this is the way to go.The board takes its power from the PC USB cable. Power for the SLIMs maybe derived from the CB or from Sam's power supply board (I use the later).
- I found that the CLK line gets overloaded by PLO3. I am working on a solution during this weekend.

- Finally: make sure that everything is working decently before you change over to USB: that way you can't blame the interface. I wasted a lot of time going back and forth because of this.

There are some finer points that i will be discussing in my forthcoming write up.

Jim, W1JGH

8147. Re: [spectrumanalyzer] Re: USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-04 13:15:36 UTC
From: Jim Hontoria
Topic: 8134 Message: 8147

Hi Eric,

Yes, that's the one. I see that they have "more than 10" so i am going to order another one for myself to experiment on a different project.
With this board there is room for expansion to the MSA functionality. Don't get a 56 pin Cypress.

Jim W1JGH

On Sat, Jun 4, 2011 at 8:53 AM, Eric Nystrom <gloimon@...> wrote:

>
>
> Jim,
>
> Thanks for the info. That helps a lot.
>
> Is this the board on Ebay?
>
>
> http://cgi.ebay.com/Cypress-CY7C68013A-EZ-USB-FX2LP-USB2-0-Develope-Board-/280535311982?pt=BI_Electrical_Equipment_Tools&hash=item415135266e
>
> Eric Nystrom
>
>
> ----------
> *From:* Jim Hontoria <jghalpha@...>
> *To:* spectrumanalyzer@yahoogroups.com
> *Sent:* Sat, June 4, 2011 8:16:49 AM
> *Subject:* Re: [spectrumanalyzer] Re: USB Support Status
>
>
>
> Hi all,
>
> I have been running now on and off with pure USB interface.(no CB at all) I
> am preparing a detailed write up but in a nutshell this is my experience:
>
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> and I have not seen (or yet attempted to measure rather) any diffrernces
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> drivers and utilities. And Sam Weterlin blended it into the spectrumanalyzer
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> Great job guys!

>
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> . No soldering or any modification is requited. Unless you enjoy soldering
> 120-pi, closely spaced, this is the way to go.The board takes its power from
> the PC USB cable. Power for the SLIMs maybe derived from the CB or from
> Sam's power supply board (I use the later).
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> - I found that the CLK line gets overloaded by PLO3. I am working on a
> solution during this weekend.
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> over to USB: that way you can't blame the interface. I wasted a lot of time
> going back and forth because of this.
>
> There are some finer points that i will be discussing in my forthcoming
> write up.
>
> Jim, W1JGH
>
>
>

--
Jim G. Hontoria

8148. Re: [spectrumanalyzer] Re: cavity filter test

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-04 16:13:50 UTC
From: SFC
Topic: 8133 Message: 8148

I thought my filter was out of tune and spent hours trying too minimize the dimple. Then I checked it with the "old" procedure and there was nothing wrong with it. I wish I had this info sooner....lol.
The dimple disappears when I place a attenuator at the input, reflections?

Simon

----- Original Message -----
From: Sam
To: spectrumanalyzer@yahoogroups.com
Sent: Friday, June 03, 2011 11:04 PM
Subject: [spectrumanalyzer] Re: cavity filter test

I have posted a photo of my cavity filter test results in the SamW photo album. For some unknown reason, I get a small dimple at exactly 0 Hz when using small RBW, but it seems to be an artifact of this special test only, and does not appear in actual operation.

You can do a lot of testing without sealing the boards, but you may get extra spurs. I would recommend you at least put the side fencing in place; with 3/8" fence that projects a little below the board (so you can solder it to the bottom), it projects only about 1/4" above the top and does not get in the way of modifications. You may have to seal mixers 1 and 2 to get a good read on the ultimate attenuation of your cavity filter, to prevent through-the-air leakage from mixer 1 to mixer 2, but it may be sufficient to just tack the covers in place.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "lbastetti" <lbastetti001@...> wrote:
>
> Dear Group,
>
> could please somebody post a picture of the MSA screen with the test of the cavity filter , as described at paragraph S of Integration and "Verification Test Procedure for the MSA,Modularized Spectrum Analyzer" page ?
> I'm not sure of the result , had problem with one faulty MMIC , so PLO2 and PLO1 are still not closed in tin box , I would prefer verify the functionality also of cavity filter before closing the oscillators .
> Is mandatory to box oscillators before this test ? I know there could be interaction between unshielded oscillators .
> I've browsed pictures , there are many cavity filter photos, but not found any of this test .
> My configuration is MSA+TR+VNA .
>
> thanks a lot
>
> Ladislao

>

_____ NOD32 6180 (20110604) Informatie _____

Dit bericht is gecontroleerd door het NOD32 Antivirus Systeem.
http://www.nod32.nl

8149. Re: MSA measurement fidelity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-05 01:40:40 UTC
From: inlinebeginner
Topic: 8116 Message: 8149

Sam

Connection: TG_out->cable->3dB->LPF->3dB->DUT->6dB->shortCable->SA_input
The result is here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/224561498/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc

Just came back from a business trip.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Wow, that was effective.
>
> I notice that there is still some residual ripple along the skirt. That is likely caused either by calibration error (seems unlikely since your 10.7 MHz graph was fine) or by one of these reflection effects:
> (Note the ripple is outside the passband, where the filter is probably very reflective at input and output).)
> 1. TG signal hits DUT, a large portion reflects back to TG output. If TG output has high return loss, this reflection is absorbed; otherwise some of it re-reflects back to the DUT, where some share of it will pass through and either increase or decrease the net transmitted signal, depending on the phase of the reflection compared to the original TG signal.
> 2. Transmitted signal reaches MSA input, some of it reflects back to the DUT, and most of that reflection is re-reflected back to the MSA input. This also increases or decreases the reading depending on phase.
> 3. In calibration with the Through, some of the TG signal reaching the MSA input reflects back to the TG output, and re-reflects to the MSA input, increasing or decreasing the reading.
>
> In all these cases, the reading increases or decreases depending on the phase of some reflection, which means it varies over frequency and therefore creates ripple. Also, in all these cases, the potentially troublesome reflection gets absorbed before causing trouble if the TG output and MSA input have high return losses. That is most easily accomplished with attenuators or buffer amps. This issue would also be dealt with by using more elaborate calibration than simple Through calibration.
>
> Enabling such calibration is high on the list of desired software features. In the meantime, attenuators and/or buffer amps are the way to go. In my design of the LO2 isolation amp, there are two amps on the board, and the second is used as a buffer amp for the TG, which solves part of this problem.
>
> It would be interesting to see how the graph looks with 10 dB attenuators on each side. Of course, you would lose the very bottom of the response, but the skirt should be more linear.

>
> Sam W.
>
>
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Scotty, Sam
> > The LPF solved the problem. Here is the result
> > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1495660066/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> >
> > The reflection might be another reson, I put a 3dB attenuator between the DUT and LPF, it gets better.
> > Thanks
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > Try the LPF first. I always run with a LPF unless I have a particular interest in the area close to 1 GHz. Note that in Transmission mode, calibration will automatically adjust for the TG dropoff caused by the LPF, but the weaker TG will reduce the dynamic range a bit. For your scan, the DUT response is high near 1 GHz, so the LPF will do no harm at all.
> > >
> > > If you are in SA+TG mode, the declining TG will be superimposed on the DUT response unless you use a Reference line created with a Through scan and specify to subtract the Reference line from the data.
> > >
> > > Sam W.
> > >
> > >
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >
> > > > That stuff between 500 and 700 MHz definitely should not be there. To some extent, it could be the result of high frequency signals in the TG, but I'm surprised it covers such a broad range. It is somewhat erratic, like noise, but doesn't seem erratic enough to actually be noise.
> > > >
> > > > Try scanning 1-1000 MHz and see how things look at lower frequencies. Also try an uncalibrated scan of the TG to see how it looks (select None under menu Operating Cal->Reference To). That will show whether the TG loses power. Another way to check the TG is just to watch the scan that occurs while you do the Through calibration; that scan shows the raw TG response, which may have some waviness but should not have any dramatic dips.
> > > >
> > > > Finally, if this is the result of >1GHz signals in the TG, you can eliminate it with a LPF on the TG.
> > > >
> > > > The fact that the attenuators reduce the 580 MHz bump (but apparently not the area around the bump) suggests that the DUT has (1) some change in reflection of IF1 that comes

out of MSA input or (2) some change in reflection of LO2 and/or LO3 coming out of the TG output. The LPF would also eliminate these effects.
> > > >
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > >
> > > > > Sam
> > > > > That is true, my MSA noise floor with 1kHz filter is -110dBm.
> > > > > I think if I increase the power level on HP, I may get better result.
> > > > > For the higher frequency, I post a new verification test result here:
> > > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1041862394/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > >
> > > > > The bump arond 580MHz can be a little bit better (maybe 5dB) if I put 6dB attenuator both at TG output and SA input.I could not find why it has that problem.Maybe the TG driving level is too low or some reflection? My MSA RBW is 1kHz.
> > > > >
> > > > > Lin
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > >
> > > > > > For what it's worth, I found an HP8753ES data sheet that specifies the typical noise level as -110 dBm, with a 10 Hz BW (that's Hz, not kHz). At 3 kHz BW, the max noise is specified as -82 dBm.
> > > > > >
> > > > > > Assuming your MSA TG is -8 dBm, your noise level appears to be -110 dBm with a 1 KHz BW. So your MSA is matching the 8753's best, and your MSA bandwidth is 100 times what the 8753 requires to meet that noise level. My guess is that in this particular scan, the 8753 BW is 3 kHz, so it has 3 times your MSA BW but 30 times as much noise.
> > > > > >
> > > > > > Sam W.
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > >
> > > > > > > MSA RBW 1kHz, HP8753ES RBW might be wider, I could not see the settings.
> > > > > > > Lin
> > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > >
> > > > > > > > What were the RBW settings for the two VNAs? I'm curious as to how much that created the better noise floor for the MSA, and how much was due to other factors.
> > > > > > > > Sam W.
> > > > > > > >
> > > > > > > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > > > > > > > >
> > > > > > > > Hi Lin,
> > > > > > > > Â We couldn't ask for a better testimonial. I'm guessing your MSA's Resolution Filter is much narrower than the HP's.
> > > > > > > > Â Your comparison really shows the accuracy of your Magnitude calibration. Well done!

> > > > > > > > > Scotty
> > > > > > > > >
> > > > > > > > > --- On Sat, 5/28/11, inlinebeginner <inlinebeginner@> wrote:
> > > > > > > > >
> > > > > > > > > From: inlinebeginner <inlinebeginner@>
> > > > > > > > > Subject: [spectrumanalyzer] MSA measurement fidelity
> > > > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > > > Date: Saturday, May 28, 2011, 10:38 PM
> > > > > > >
> > > > > > > > > How accurate the MSA could be comparing to the commercial equipment?
> > > > > > > > >
> > > > > > > > > Here is a 10.7MHz RBW filter test result comparison between MSA TG mode
and HP8753ES
> > > > > > > > >
> > > > > > > > >
> > > > > > > > >
> > > > > > > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pi
c/643419936/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > > > > > >
> > > > > > > > >
> > > > > > > > >
> > > > > > > > > The two curves are almost the same above HP8753ES noise floor. However,
below the HP8753ES noise floor, the MSA has better testability. This is because of its
better noise floor.
> > > > > > > > >
> > > > > > > > >
> > > > > > > > >
> > > > > > > > > Lin
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8150. Re: [spectrumanalyzer] Re: cavity filter test

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-05 03:36:00 UTC
From: william sprowls
Topic: 8133 Message: 8150

Hi Simon,
 I have not done any troubleshooting on this "weirdo" dimple. It occurs on my Original MSA but does not on the Verification MSA.
Since I don't have my lab anymore, my testing is quite limited.
Scotty

--- On Sat, 6/4/11, SFC <sf-cillari@...> wrote:

From: SFC <sf-cillari@hetnet.nl>
Subject: Re: [spectrumanalyzer] Re: cavity filter test
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, June 4, 2011, 11:13 AM

I thought my filter was out of tune and spent hours
trying too minimize the dimple. Then I checked it with the "old" procedure
and there was nothing wrong with it. I wish I had this info sooner....lol.

The dimple disappears when I place a attenuator at
the input, reflections?

Simon

----- Original Message -----
From:
Sam

To: spectrumanalyzer@yahoogroups.com

Sent: Friday, June 03, 2011 11:04
PM
Subject: [spectrumanalyzer] Re: cavity
filter test

I have posted a photo of my cavity filter test results in the SamW photo
album. For some unknown reason, I get a small dimple at exactly 0 Hz when
using small RBW, but it seems to be an artifact of this special test only, and
does not appear in actual operation.

You can do a lot of testing
without sealing the boards, but you may get extra spurs. I would recommend you
at least put the side fencing in place; with 3/8" fence that projects a little
below the board (so you can solder it to the bottom), it projects only about
1/4" above the top and does not get in the way of modifications. You may have
to seal mixers 1 and 2 to get a good read on the ultimate attenuation of your
cavity filter, to prevent through-the-air leakage from mixer 1 to mixer 2, but
it may be sufficient to just tack the covers in place.

Sam
W.

--- In spectrumanalyzer@yahoogroups.com,
"lbastetti" <lbastetti001@...> wrote:
>
> Dear
Group,
>
> could please somebody post a picture of the MSA screen
with the test of the cavity filter , as described at paragraph S of
Integration and "Verification Test Procedure for the MSA,Modularized Spectrum
Analyzer" page ?
> I'm not sure of the result , had problem with one
faulty MMIC , so PLO2 and PLO1 are still not closed in tin box , I would
prefer verify the functionality also of cavity filter before closing the
oscillators .
> Is mandatory to box oscillators before this test ? I
know there could be interaction between unshielded oscillators .
> I've
browsed pictures , there are many cavity filter photos, but not found any of
this test .
> My configuration is MSA+TR+VNA .
>
> thanks
a lot
>
> Ladislao
>

_____
NOD32 6180 (20110604) Informatie _____

Dit bericht is
gecontroleerd door het NOD32 Antivirus Systeem.
http://www.nod32.nl

8151. Re: MSA measurement fidelity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-05 14:17:40 UTC
From: Sam
Topic: 8116 Message: 8151

That seems to tame the ripple on the MSA response. Note that the same issues of return loss on the Tx and Rx ports probably exists for the HP.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
>
> Connection: TG_out->cable->3dB->LPF->3dB->DUT->6dB->shortCable->SA_input
> The result is here:
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/224561498/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
>
> Just came back from a business trip.
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Wow, that was effective.
> >
> > I notice that there is still some residual ripple along the skirt. That is likely caused either by calibration error (seems unlikely since your 10.7 MHz graph was fine) or by one of these reflection effects:
> > (Note the ripple is outside the passband, where the filter is probably very reflective at input and output).)
> > 1. TG signal hits DUT, a large portion reflects back to TG output. If TG output has high return loss, this reflection is absorbed; otherwise some of it re-reflects back to the DUT, where some share of it will pass through and either increase or decrease the net transmitted signal, depending on the phase of the reflection compared to the original TG signal.
> > 2. Transmitted signal reaches MSA input, some of it reflects back to the DUT, and most of that reflection is re-reflected back to the MSA input. This also increases or decreases the reading depending on phase.
> > 3. In calibration with the Through, some of the TG signal reaching the MSA input reflects back to the TG output, and re-reflects to the MSA input, increasing or decreasing the reading.
> >
> > In all these cases, the reading increases or decreases depending on the phase of some reflection, which means it varies over frequency and therefore creates ripple. Also, in all these cases, the potentially troublesome reflection gets absorbed before causing trouble if the TG output and MSA input have high return losses. That is most easily accomplished with attenuators or buffer amps. This issue would also be dealt with by using more elaborate calibration than simple Through calibration.
> >
> > Enabling such calibration is high on the list of desired software features. In the

meantime, attenuators and/or buffer amps are the way to go. In my design of the LO2 isolation amp, there are two amps on the board, and the second is used as a buffer amp for the TG, which solves part of this problem.
> >
> > It would be interesting to see how the graph looks with 10 dB attenuators on each side. Of course, you would lose the very bottom of the response, but the skirt should be more linear.
> >
> > Sam W.
> >
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > >
> > > Scotty, Sam
> > > The LPF solved the problem. Here is the result
> > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1495660066/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > >
> > > The reflection might be another reson, I put a 3dB attenuator between the DUT and LPF, it gets better.
> > > Thanks
> > > Lin
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >
> > > > Try the LPF first. I always run with a LPF unless I have a particular interest in the area close to 1 GHz. Note that in Transmission mode, calibration will automatically adjust for the TG dropoff caused by the LPF, but the weaker TG will reduce the dynamic range a bit. For your scan, the DUT response is high near 1 GHz, so the LPF will do no harm at all.
> > > >
> > > > If you are in SA+TG mode, the declining TG will be superimposed on the DUT response unless you use a Reference line created with a Through scan and specify to subtract the Reference line from the data.
> > > >
> > > > Sam W.
> > > >
> > > >
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > >
> > > > > That stuff between 500 and 700 MHz definitely should not be there. To some extent, it could be the result of high frequency signals in the TG, but I'm surprised it covers such a broad range. It is somewhat erratic, like noise, but doesn't seem erratic enough to actually be noise.
> > > > >
> > > > > Try scanning 1-1000 MHz and see how things look at lower frequencies. Also try an uncalibrated scan of the TG to see how it looks (select None under menu Operating Cal->Reference To). That will show whether the TG loses power. Another way to check the TG is just to watch the scan that occurs while you do the Through calibration; that scan shows

the raw TG response, which may have some waviness but should not have any dramatic dips.
> > > > >
> > > > > Finally, if this is the result of >1GHz signals in the TG, you can eliminate it with a LPF on the TG.
> > > > >
> > > > > The fact that the attenuators reduce the 580 MHz bump (but apparently not the area around the bump) suggests that the DUT has (1) some change in reflection of IF1 that comes out of MSA input or (2) some change in reflection of LO2 and/or LO3 coming out of the TG output. The LPF would also eliminate these effects.
> > > > >
> > > > > Sam W.
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > >
> > > > > > Sam
> > > > > > That is true, my MSA noise floor with 1kHz filter is -110dBm.
> > > > > > I think if I increase the power level on HP, I may get better result.
> > > > > > For the higher frequency, I post a new verification test result here:
> > > > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1041862394/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > > >
> > > > > > The bump arond 580MHz can be a little bit better (maybe 5dB) if I put 6dB attenuator both at TG output and SA input.I could not find why it has that problem.Maybe the TG driving level is too low or some reflection? My MSA RBW is 1kHz.
> > > > > >
> > > > > > Lin
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > >
> > > > > > > For what it's worth, I found an HP8753ES data sheet that specifies the typical noise level as -110 dBm, with a 10 Hz BW (that's Hz, not kHz). At 3 kHz BW, the max noise is specified as -82 dBm.
> > > > > > >
> > > > > > > Assuming your MSA TG is -8 dBm, your noise level appears to be -110 dBm with a 1 KHz BW. So your MSA is matching the 8753's best, and your MSA bandwidth is 100 times what the 8753 requires to meet that noise level. My guess is that in this particular scan, the 8753 BW is 3 kHz, so it has 3 times your MSA BW but 30 times as much noise.
> > > > > > >
> > > > > > > Sam W.
> > > > > > >
> > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > >
> > > > > > > > MSA RBW 1kHz, HP8753ES RBW might be wider, I could not see the settings.
> > > > > > > > Lin
> > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > > >
> > > > > > > > What were the RBW settings for the two VNAs? I'm curious as to how much that created the better noise floor for the MSA, and how much was due to other factors.
> > > > > > > > Sam W.

> > > > > > > > >
> > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@>
wrote:
> > > > > > > > > >
> > > > > > > > > > > Hi Lin,
> > > > > > > > > > > > Â We couldn't ask for a better testimonial. I'm guessing your MSA's
Resolution Filter is much narrower than the HP's.
> > > > > > > > > > > > Â Your comparison really shows the accuracy of your Magnitude
calibration. Well done!
> > > > > > > > > > > > Scotty
> > > > > > > > > > >
> > > > > > > > > > > > --- On Sat, 5/28/11, inlinebeginner <inlinebeginner@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > > > From: inlinebeginner <inlinebeginner@>
> > > > > > > > > > > > > Subject: [spectrumanalyzer] MSA measurement fidelity
> > > > > > > > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > > > > > > > Date: Saturday, May 28, 2011, 10:38 PM
> > > > > > > >
> > > > > > > > > > > > > How accurate the MSA could be comparing to the commercial equipment?
> > > > > > > > > > >
> > > > > > > > > > > > > > Here is a 10.7MHz RBW filter test result comparison between MSA TG mode
and HP8753ES
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/
pic/643419936/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > > > > The two curves are almost the same above HP8753ES noise floor. However,
below the HP8753ES noise floor, the MSA has better testability. This is because of its
better noise floor.
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > > > Lin
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8152. Re: USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-06 05:52:46 UTC
From: forbes3100
Topic: 8134 Message: 8152

For yet another approach...

I'm using a USB-to-parallel board copied from Dave Roberts' design (thanks Dave!), but have gone a slightly different direction on the code: I have it streaming commands out in 512-byte packets, including the delay commands, and receiving the data in a separate read stream. This gets around the latency problem with USB and the non-realtime nature of modern OSes, since the FX2 is now doing all critical timing.

The code is also all open-source and runs on Windows, Linux, and Mac OSX in wxPython. The FX2 code compiles with SDCC and downloads with cycfx2prog (Linux & Mac). I have the main-line VNA code running but have yet to port the rest of it. I'll post what I have so far if anyone's interested. My preference would be to put it up on SourceForge, using SVN for source control.

--Scott

8153. Re: USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-06 10:36:33 UTC
From: david529007
Topic: 8134 Message: 8153

Hi Scott

It is not clear to me what latency you are referring to. With the current approach the only latency is the delay from asking the ADC to convert to getting the response in the next microframe - that you always have.

That having been said, I'm interested to see your approach. Also be very careful - you will find that the chip imposes a 64 byte packet limit for usb 1.1 interfaces.

Dave

1. it gets split over two subframes

--- In spectrumanalyzer@yahoogroups.com, "forbes3100" <forbes3100@...> wrote:
>
> For yet another approach...
>
> I'm using a USB-to-parallel board copied from Dave Roberts' design (thanks Dave!), but have gone a slightly different direction on the code: I have it streaming commands out in 512-byte packets, including the delay commands, and receiving the data in a separate read stream. This gets around the latency problem with USB and the non-realtime nature of modern OSes, since the FX2 is now doing all critical timing.
>
> The code is also all open-source and runs on Windows, Linux, and Mac OSX in wxPython. The FX2 code compiles with SDCC and downloads with cycfx2prog (Linux & Mac). I have the main-line VNA code running but have yet to port the rest of it. I'll post what I have so far if anyone's interested. My preference would be to put it up on SourceForge, using SVN for source control.
>
> --Scott
>

8154. Re: USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-06 16:02:54 UTC
From: forbes3100
Topic: 8134 Message: 8154

Hi Dave,

That latency has actually mostly disappeared since fixing a read-timeout bug, so yes, it's small compared to the PLL-settling delay. Anyway, I'll post what I have.

--Scott

--- In spectrumanalyzer@yahoogroups.com, "david529007" <dave.roberts@...> wrote:
>
> Hi Scott
>
> It is not clear to me what latency you are referring to. With the current approach the only latency is the delay from asking the ADC to convert to getting the response in the next microframe - that you always have.
>
> That having been said, I'm interested to see your approach. Also be very careful - you will find that the chip imposes a 64 byte packet limit for usb 1.1 interfaces.
>
> Dave

8155. ADC output buffer transistor for USB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-07 22:58:00 UTC
From: jghbeta
Topic: 8155 Message: 8155

Scotty,

Although not shown in the ADC schematic, the original configuration with the MUN2211 transistor had a pull up resistor at the parallel port pin.
The Cypress ports PA4 and PA5 which are the recipients of the ADC output transistors (now 2N7002) are limited to 10 mA and a maximum voltage of 5.25V.
Shouldn't we have a 500 ohm resistor from the gate to +5 Vcc and take the gate output to the ports?

Jim W1JGH

8156. Re: USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-08 00:02:17 UTC
From: forbes3100
Topic: 8134 Message: 8156

I've put the code up at http://sourceforge.net/projects/msapy -- you can download or browse the code there. I welcome all comments, fixes, etc.

--Scott

--- In spectrumanalyzer@yahoogroups.com, "david529007" <dave.roberts@...> wrote:
>
> Hi Scott
>
> It is not clear to me what latency you are referring to. With the current approach the only latency is the delay from asking the ADC to convert to getting the response in the next microframe - that you always have.
>
> That having been said, I'm interested to see your approach. Also be very careful - you will find that the chip imposes a 64 byte packet limit for usb 1.1 interfaces.
>
> Dave

8157. Band switching hardware implementation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-08 00:30:50 UTC
From: jghbeta
Topic: 8157 Message: 8157

Is there a hardware implementation (other than the diplexer board) for band switching?

Jim W1JGH

8158. Re: USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-08 09:32:52 UTC
From: jghbeta
Topic: 8134 Message: 8158

It appears that the only Python versions are Python 2.7.1 and Python 3.2. Python 2.5 is not even mentioned in the sourceforge web site.

Jim W1JGH

--- In spectrumanalyzer@yahoogroups.com, "forbes3100" <forbes3100@...> wrote:
>
> I've put the code up at http://sourceforge.net/projects/msapy -- you can download or browse the code there. I welcome all comments, fixes, etc.
>
> --Scott
>
> --- In spectrumanalyzer@yahoogroups.com, "david529007" <dave.roberts@> wrote:
> >
> > Hi Scott
> >
> > It is not clear to me what latency you are referring to. With the current approach the only latency is the delay from asking the ADC to convert to getting the response in the next microframe - that you always have.
> >
> > That having been said, I'm interested to see your approach. Also be very careful - you will find that the chip imposes a 64 byte packet limit for usb 1.1 interfaces.
> >
> > Dave
>

8159. Re: [spectrumanalyzer] ADC output buffer transistor for USB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-08 12:44:16 UTC
From: william sprowls
Topic: 8155 Message: 8159

Hi Jim,
The reason the buffers are there is because the ADC chip cannot drive the parallel port directly. They are speced at only +/- 500 ua max.
  The Cypress chip could handle the direct output of the ADC (without a buffer), but would require a large software change.
Scotty

--- On Tue, 6/7/11, jghbeta <jghalpha@...> wrote:

From: jghbeta <jghalpha@...>
Subject: [spectrumanalyzer] ADC output buffer transistor for USB
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, June 7, 2011, 5:58 PM

Scotty,

Although not shown in the ADC schematic, the original configuration with the MUN2211 transistor had a pull up resistor at the parallel port pin.

The Cypress ports PA4 and PA5 which are the recipients of the ADC output transistors (now 2N7002) are limited to 10 mA and a maximum voltage of 5.25V.

Shouldn't we have a 500 ohm resistor from the gate to +5 Vcc and take the gate output to the ports?

Jim W1JGH

8160. Re: Band switching hardware implementation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-08 13:44:06 UTC
From: Sam
Topic: 8157 Message: 8160

I have an SPDT board that was included on one of the recent group buy boards, but I have not built it yet. It is a simple combination of three PE4251 switches to provide high isolation. Super-high isolation actually is not necessary if you provide filtering at the MSA input to modestly reduce out-of-band signals, so you could also get by with a cheap relay such as one of the HF3 relays. The 12V version draws a relatively small amount of current so it is not necessary to use a latching relay.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> Is there a hardware implementation (other than the diplexer board) for band switching?
>
> Jim W1JGH
>

8161. Re: USB Support Status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-08 15:45:51 UTC
From: forbes3100
Topic: 8134 Message: 8161

Sorry about that-- they've updated it. The current 2.5 with a Windows release is 2.5.4, so go to:

http://www.python.org/download/releases/2.5.4

And get Python-2.5.4.msi. Also fixed the numpy location and updated msapy.py, now version 0.0.2.

--Scott

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> It appears that the only Python versions are Python 2.7.1 and Python 3.2. Python 2.5 is not even mentioned in the sourceforge web site.
>
> Jim W1JGH

8162. Re: [spectrumanalyzer] Re: Band switching hardware implementation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-08 17:55:54 UTC
From: Eric Nystrom
Topic: 8157 Message: 8162

Sam,

Do you know where the PE4251 can be obtained? Digikey is out of stock on those.

Eric Nystrom

From: Sam <swetterlin@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Wed, June 8, 2011 9:44:06 AM
Subject: [spectrumanalyzer] Re: Band switching hardware implementation

I have an SPDT board that was included on one of the recent group buy boards, but I have not built it yet. It is a simple combination of three PE4251 switches to provide high isolation. Super-high isolation actually is not necessary if you provide filtering at the MSA input to modestly reduce out-of-band signals, so you could also get by with a cheap relay such as one of the HF3 relays. The 12V version draws a relatively small amount of current so it is not necessary to use a latching relay.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> Is there a hardware implementation (other than the diplexer board) for band
>switching?
>
> Jim W1JGH
>

8163. Re: [spectrumanalyzer] Re: Band switching hardware implementation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-08 18:16:43 UTC
From: Dan Ellis
Topic: 8157 Message: 8163

You should be able to order these directly from Peregrine

http://www.rell.com/Pages/Product-Details.aspx?productId=937745

Dan

8164. Re: ADC output buffer transistor for USB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-08 19:05:06 UTC
From: jghbeta
Topic: 8155 Message: 8164

Hi Scotty,
Sorry I did not make myself clear. I am not referring to the need for the buffers , but to the actual hardware implementation of their output when using the USB Cypress chip. With the tradional parallel port there is a pull up resistor but this is not the case with the Cypress port. I was seeking for confirmation that I should add a pull up ressitor then.

Jim W1JGH

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Jim,
> The reason the buffers are there is because the ADC chip cannot drive the parallel port directly. They are speced at only +/- 500 ua max.
> Â The Cypress chip could handle the direct output of the ADC (without a buffer), but would require a large software change.
> Scotty
>
> --- On Tue, 6/7/11, jghbeta <jghalpha@...> wrote:
>
> From: jghbeta <jghalpha@...>
> Subject: [spectrumanalyzer] ADC output buffer transistor for USB
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, June 7, 2011, 5:58 PM
>
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>
> Scotty,
>
>
>
> Although not shown in the ADC schematic, the original configuration with the MUN2211

transistor had a pull up resistor at the parallel port pin.
>
> The Cypress ports PA4 and PA5 which are the recipients of the ADC output transistors (now 2N7002) are limited to 10 mA and a maximum voltage of 5.25V.
>
> Shouldn't we have a 500 ohm resistor from the gate to +5 Vcc and take the gate output to the ports?
>
>
>
> Jim W1JGH
>

8165. Re: Band switching hardware implementation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-08 20:54:20 UTC
From: Sam
Topic: 8157 Message: 8165

That is the place to get them, though it is actually Richardson Electronics, not a link to Peregrine. They are dirt cheap.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Dan Ellis <dhellis@...> wrote:
>
> You should be able to order these directly from Peregrine
>
> http://www.rell.com/Pages/Product-Details.aspx?productId=937745
>
> Dan
>

8166. Re: Band switching hardware implementation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-08 21:04:15 UTC
From: Sam
Topic: 8157 Message: 8166

I should add that the PE4251 has an unusual feature--a square pad in the center of the IC bottom. That has to be soldered to ground. On my board, there is a large hole under the IC, so you can solder from the bottom. It works best if you first stuff the hole with solder paste, which will assure that the solder adheres to all necessary surfaces.
Conceivably you can do the soldering by applying solder paste and then heating from the top (soldering iron or hot air), but it is difficult to tell whether or not that is working.

I think it is the grounded pad that accounts for the amazingly good isolation.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> That is the place to get them, though it is actually Richardson Electronics, not a link to Peregrine. They are dirt cheap.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Dan Ellis <dhellis@> wrote:
> >
> > You should be able to order these directly from Peregrine
> >
> > http://www.rell.com/Pages/Product-Details.aspx?productId=937745
> >
> > Dan
> >
>

8167. Re: [spectrumanalyzer] Re: ADC output buffer transistor for USB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-08 23:00:39 UTC
From: william sprowls
Topic: 8155 Message: 8167

Hi Jim,
 David has implemented the SLIM-ADC Module with his USB chip without a pull-up. He can correct me on this, but you may be able to "tell" the USB chip to turn on an internal pull-up on a port that is commanded to be an input.
Scotty

--- On Wed, 6/8/11, jghbeta <jghalpha@...> wrote:

From: jghbeta <jghalpha@...>
Subject: [spectrumanalyzer] Re: ADC output buffer transistor for USB
To: spectrumanalyzer@yahoogroups.com
Date: Wednesday, June 8, 2011, 2:05 PM

Hi Scotty,

Sorry I did not make myself clear. I am not referring to the need for the buffers , but to the actual hardware implementation of their output when using the USB Cypress chip. With the tradional parallel port there is a pull up resistor but this is not the case with the Cypress port. I was seeking for confirmation that I should add a pull up ressitor then.

Jim W1JGH

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:

>

> Hi Jim,

> The reason the buffers are there is because the ADC chip cannot drive the parallel port directly. They are speced at only +/- 500 ua max.

> Â The Cypress chip could handle the direct output of the ADC (without a buffer), but would require a large software change.

> Scotty

>

> --- On Tue, 6/7/11, jghbeta <jghalpha@...> wrote:

>

> From: jghbeta <jghalpha@...>

> Subject: [spectrumanalyzer] ADC output buffer transistor for USB

> To: spectrumanalyzer@yahoogroups.com

> Date: Tuesday, June 7, 2011, 5:58 PM

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> Scotty,

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> Although not shown in the ADC schematic, the original configuration with the MUN2211 transistor had a pull up resistor at the parallel port pin.

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> The Cypress ports PA4 and PA5 which are the recipients of the ADC output transistors (now 2N7002) are limited to 10 mA and a maximum voltage of 5.25V.

>

> Shouldn't we have a 500 ohm resistor from the gate to +5 Vcc and take the gate output to the ports?

>

>

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> Jim W1JGH

>

8168. Re: ADC output buffer transistor for USB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-09 21:20:13 UTC
From: david529007
Topic: 8155 Message: 8168

Apologies - I may have forgotten to document it.

I put a 1K pullup on the buffer chip output

Dave

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Jim,
> Â David has implemented the SLIM-ADC Module with his USB chip without a pull-up. He can correct me on this, but you may be able to "tell" the USB chip to turn on an internal pull-up on a port that is commanded to be an input.
> Scotty
>
> --- On Wed, 6/8/11, jghbeta <jghalpha@...> wrote:
>
> From: jghbeta <jghalpha@...>
> Subject: [spectrumanalyzer] Re: ADC output buffer transistor for USB
> To: spectrumanalyzer@yahoogroups.com
> Date: Wednesday, June 8, 2011, 2:05 PM
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> Jim W1JGH
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> --- In spectrumanalyzer@...m, william sprowls <wsprowls@> wrote:
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> > Hi Jim,
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> > The reason the buffers are there is because the ADC chip cannot drive the parallel port directly. They are speced at only +/- 500 ua max.
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> > ÃÂ The Cypress chip could handle the direct output of the ADC (without a buffer), but would require a large software change.
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> > --- On Tue, 6/7/11, jghbeta <jghalpha@> wrote:
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> > From: jghbeta <jghalpha@>
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> > Subject: [spectrumanalyzer] ADC output buffer transistor for USB
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> > To: spectrumanalyzer@yahoogroups.com
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> > Date: Tuesday, June 7, 2011, 5:58 PM
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> > Scotty,
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> > Although not shown in the ADC schematic, the original configuration with the MUN2211 transistor had a pull up resistor at the parallel port pin.
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> > The Cypress ports PA4 and PA5 which are the recipients of the ADC output transistors (now 2N7002) are limited to 10 mA and a maximum voltage of 5.25V.
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> > Shouldn't we have a 500 ohm resistor from the gate to +5 Vcc and take the gate output to the ports?
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> > Jim W1JGH
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8169. Re: [spectrumanalyzer] Re: ADC output buffer transistor for USB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-10 19:03:06 UTC
From: Jim Hontoria
Topic: 8155 Message: 8169

Dave,
Just so I understand it: the two input ports, PA4 (phase) and PA5 (magnitude), which receive data from the ADC buffer transistors should have about 3.3 volts in the absence of any signal. I measure 0.040 volts for the phase port and 2.2 for the amplitude.

I have some other not related issues which mask the response and make a more thorough testing difficult: It appears that the 5 dataclk lines are overloading PB0 and I cannot run PLO1 and PLO3 together until I resolve that. In spite of that, I tried adding a 10K a pullup resistor to 5 volts to the magnitude buffer transistor (which theoretically should be in parallel with the PA5 port pullup) and the "responsiveness" improved (for example I could see the effect of the video filters on the noise which I couldn't see before). Since the Cypress chip specs says that an input port will take up to 5.5 volts, the pullup to 5V should be OK and is easier to implement than doing it to 3.3V.

I still owe you a response on the issue of running the USB port through a hub. It is working fine directly attached to the PC so I am trying to resolve the other issues above first.

73, Jim W1JGH

On Thu, Jun 9, 2011 at 5:20 PM, david529007 <dave.roberts@...>wrote:

>
>
> Apologies - I may have forgotten to document it.
>
> I put a 1K pullup on the buffer chip output
>
> Dave
>
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...>
> wrote:
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> > Hi Jim,
> > Â David has implemented the SLIM-ADC Module with his USB chip without a
> pull-up. He can correct me on this, but you may be able to "tell" the USB
> chip to turn on an internal pull-up on a port that is commanded to be an
> input.
> > Scotty
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> >
> > --- On Wed, 6/8/11, jghbeta <jghalpha@...> wrote:

> >
> > From: jghbeta <jghalpha@...>
> > Subject: [spectrumanalyzer] Re: ADC output buffer transistor for USB
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Wednesday, June 8, 2011, 2:05 PM
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> buffers , but to the actual hardware implementation of their output when
> using the USB Cypress chip. With the tradional parallel port there is a pull
> up resistor but this is not the case with the Cypress port. I was seeking
> for confirmation that I should add a pull up ressitor then.
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> > Jim W1JGH
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> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@>
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> > > Hi Jim,
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> > > The reason the buffers are there is because the ADC chip cannot drive
> the parallel port directly. They are speced at only +/- 500 ua max.
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> > > Ã‚Â The Cypress chip could handle the direct output of the ADC
> (without a buffer), but would require a large software change.
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> >
> > > Scotty
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> > > --- On Tue, 6/7/11, jghbeta <jghalpha@> wrote:
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> > > From: jghbeta <jghalpha@>
> >
> > > Subject: [spectrumanalyzer] ADC output buffer transistor for USB
> >
> > > To: spectrumanalyzer@yahoogroups.com
> >
> > > Date: Tuesday, June 7, 2011, 5:58 PM
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> output transistors (now 2N7002) are limited to 10 mA and a maximum voltage
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> > > Shouldn't we have a 500 ohm resistor from the gate to +5 Vcc and take
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> > > Jim W1JGH
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Jim G. Hontoria

8170. Re: ADC output buffer transistor for USB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-15 06:36:06 UTC
From: david529007
Topic: 8155 Message: 8170

Hi Jim

Sorry for the delay - not got much access to computer at the moment.

Pull-ups to 3.3V and those voltages are fine. Equally a pullup to 5V would as you say work just as well as the ports are 5V tolerant. Given your report I'd probably agree and recomment a pullup to 5V.

On loading, you probably have more experience here than I do since I did not have a fully configured MSA when doing the development. Sounds, like I think Sam or Scotty said, that a buffer would be a good idea

Dave

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> Dave,
> Just so I understand it: the two input ports, PA4 (phase) and PA5
> (magnitude), which receive data from the ADC buffer transistors should have
> about 3.3 volts in the absence of any signal. I measure 0.040 volts for the
> phase port and 2.2 for the amplitude.
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> I have some other not related issues which mask the response and make a more
> thorough testing difficult: It appears that the 5 dataclk lines are
> overloading PB0 and I cannot run PLO1 and PLO3 together until I resolve
> that. In spite of that, I tried adding a 10K a pullup resistor to 5 volts to
> the magnitude buffer transistor (which theoretically should be in parallel
> with the PA5 port pullup) and the "responsiveness" improved (for example I
> could see the effect of the video filters on the noise which I couldn't see
> before). Since the Cypress chip specs says that an input port will take up
> to 5.5 volts, the pullup to 5V should be OK and is easier to implement than
> doing it to 3.3V.
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> I still owe you a response on the issue of running the USB port through a
> hub. It is working fine directly attached to the PC so I am trying to
> resolve the other issues above first.
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> 73, Jim W1JGH
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> On Thu, Jun 9, 2011 at 5:20 PM, david529007 <dave.roberts@...>wrote:
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> > I put a 1K pullup on the buffer chip output
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> > Dave
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> > wrote:
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> > > Â David has implemented the SLIM-ADC Module with his USB chip without a
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> > input.
> > > Scotty
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> > > --- On Wed, 6/8/11, jghbeta <jghalpha@> wrote:
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> > > From: jghbeta <jghalpha@>
> > > Subject: [spectrumanalyzer] Re: ADC output buffer transistor for USB
> > > To: spectrumanalyzer@yahoogroups.com
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> > > > Jim W1JGH
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> Jim G. Hontoria
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8171. MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 13:39:18 UTC
From: jghbeta
Topic: 8171 Message: 8171

I have someform of oscillation/ high noise that extends from 0 to about 140 MHz. No signal gets thru even the zero hump disappears. beyond that, there is no noise and I getbnice, sharp clear signals. I just have the MSA running. Any ideas?

This site has become so quiet lately...

Jim W1JGH

8172. RE: [spectrumanalyzer] MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 14:13:34 UTC
From: Mark Burgin
Topic: 8171 Message: 8172

Hi Jim

I had exactly the same problem. I bet you are using the adf4112 or adf4113 chip rather than the LMX2326. The adf411X chips seem to default to a higher output current than the LMX 2326 which increases the loop gain causing instability. There was a bug in earlier versions of the software that did not take account of this but I believe that current versions are OK so long as you have the ADF4112 set in the configuration settings.

If you need more information or help let me know and I will tell you what to check.

Mark

From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of jghbeta
Sent: 18 June 2011 14:39
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] MSA oscillation

I have someform of oscillation/ high noise that extends from 0 to about 140 MHz. No signal gets thru even the zero hump disappears. beyond that, there is no noise and I getbnice, sharp clear signals. I just have the MSA running. Any ideas?

This site has become so quiet lately...

Jim W1JGH

8173. Re: [spectrumanalyzer] MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 14:46:16 UTC
From: Jim Hontoria
Topic: 8171 Message: 8173

Hi Mark,

Yes I have the 4112s (with the famous extra resistor in place). I also have the latest software so I don't think that the bug fix made it to this one. After you mentioned it, I seem to recall now reading something about all this so I'm going to check the yahoo site mail and see if I find something. Any info you may have is greatly appreciated.

Jim W1JGH

On Sat, Jun 18, 2011 at 10:13 AM, Mark Burgin <mark@...> wrote:

> **
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>
> Hi Jim****
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> ** **
>
> I had exactly the same problem. I bet you are using the adf4112 or adf4113
> chip rather than the LMX2326. The adf411X chips seem to default to a higher
> output current than the LMX 2326 which increases the loop gain causing
> instability. There was a bug in earlier versions of the software that did
> not take account of this but I believe that current versions are OK so long
> as you have the ADF4112 set in the configuration settings.****
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> ** **
>
> If you need more information or help let me know and I will tell you what
> to check.****
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> Mark****
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> ** **
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> *From:* spectrumanalyzer@yahoogroups.com [mailto:
> spectrumanalyzer@yahoogroups.com] *On Behalf Of *jghbeta
> *Sent:* 18 June 2011 14:39
> *To:* spectrumanalyzer@yahoogroups.com
> *Subject:* [spectrumanalyzer] MSA oscillation****
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> I have someform of oscillation/ high noise that extends from 0 to about 140
> MHz. No signal gets thru even the zero hump disappears. beyond that, there
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> running. Any ideas?
>
> This site has become so quiet lately...
>
> Jim W1JGH****
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Jim G. Hontoria

8174. Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 15:06:59 UTC
From: Sam
Topic: 8171 Message: 8174

All of the beta software versions (which are all version 116-xx) have the necessary software fix for the ADF4112,3 and should work if you use the 4.7k current-setting resistor and specify the ADF4112 chip in the Configuration Manager.

In the more recent beta versions, there is a misleading instruction in the Configuration Manager:
"For ADF411x, specify 2326"

This was supposed to apply only to the ADF4118 and should read:
"For ADF4118, specify 2326"

There is a specific list entry for specifying the 4112, which also applies for the 4113.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Mark Burgin <mark@...> wrote:
>
> Hi Jim
>
> I had exactly the same problem. I bet you are using the adf4112 or adf4113 chip rather than the LMX2326. The adf411X chips seem to default to a higher output current than the LMX 2326 which increases the loop gain causing instability. There was a bug in earlier versions of the software that did not take account of this but I believe that current versions are OK so long as you have the ADF4112 set in the configuration settings.
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> Mark
>
> From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of jghbeta
> Sent: 18 June 2011 14:39
> To: spectrumanalyzer@yahoogroups.com
> Subject: [spectrumanalyzer] MSA oscillation
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> I have someform of oscillation/ high noise that extends from 0 to about 140 MHz. No signal gets thru even the zero hump disappears. beyond that, there is no noise and I getbnice, sharp clear signals. I just have the MSA running. Any ideas?
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> This site has become so quiet lately...
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> Jim W1JGH
>

8175. Re: [spectrumanalyzer] Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 15:25:56 UTC
From: Jim Hontoria
Topic: 8171 Message: 8175

Hi Sam,
Did the changes introcuced in Create4112initBuffer for the CB version made
it to the cb=3 (usb section) of the routine?

Jim W1JGH

On Sat, Jun 18, 2011 at 11:06 AM, Sam <swetterlin@...> wrote:

> **
>
>
> All of the beta software versions (which are all version 116-xx) have the
> necessary software fix for the ADF4112,3 and should work if you use the 4.7k
> current-setting resistor and specify the ADF4112 chip in the Configuration
> Manager.
>
> In the more recent beta versions, there is a misleading instruction in the
> Configuration Manager:
> "For ADF411x, specify 2326"
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> This was supposed to apply only to the ADF4118 and should read:
> "For ADF4118, specify 2326"
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> There is a specific list entry for specifying the 4112, which also applies
> for the 4113.
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> Sam W.
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>
> --- In spectrumanalyzer@yahoogroups.com, Mark Burgin <mark@...> wrote:
> >
> > Hi Jim
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> > I had exactly the same problem. I bet you are using the adf4112 or
> adf4113 chip rather than the LMX2326. The adf411X chips seem to default to a
> higher output current than the LMX 2326 which increases the loop gain
> causing instability. There was a bug in earlier versions of the software
> that did not take account of this but I believe that current versions are OK
> so long as you have the ADF4112 set in the configuration settings.
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> > If you need more information or help let me know and I will tell you what
> to check.
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> > Mark
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> > From: spectrumanalyzer@...m [mailto:
> spectrumanalyzer@yahoogroups.com] On Behalf Of jghbeta
> > Sent: 18 June 2011 14:39
> > To: spectrumanalyzer@yahoogroups.com
> > Subject: [spectrumanalyzer] MSA oscillation
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> >
> > I have someform of oscillation/ high noise that extends from 0 to about
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> running. Any ideas?
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> > Jim W1JGH
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Jim G. Hontoria

8176. Re: [spectrumanalyzer] MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 15:29:42 UTC
From: william sprowls
Topic: 8171 Message: 8176

Hi Jim,
 If you are using Version 115 (and) using it with Liberty Basic, you can just change the code. Go and find the following code:

```
[Command4112R]'needed:
rcounter,preselector,phasepolarity,control,Jcontrol,port,LEPLL,contclear ; commands AD4112
rcounter
  '[Create4112InitBuffer]'needed:preselector,phasepolarity
    N23=1     'N24,23 prescaler: 0=8, 1=16, 2=32, 3=64
    N22=0     'preselector defaulted to 32
    if preselector =8 then N23=0:N22=0
    if preselector =16 then N23=0:N22=1
    if preselector =64 then N23=1:N22=1
    N21=0     'Power Down Mode, 0=async, 1=sync  use 0
    N20=1     'N22,21,20 Phase Current for Set 2
    N19=1     'current= min current + min current*bit value
    N18=1     'use bit value of 7 and 4.7 Kohm for 5.0 ma
    N17=1     'N18,17,16 Phase Current for Set 1
    N16=1     'current= min current + min current*bit value
    N15=1     'use bit value of 7 and 4.7 Kohm for 5.0 ma
```

in the above code, change N15 thru N20 to the following:

```
        N20=0     'N20,19,18 Phase Current for Set 2            '12-3-10
        N19=0     'current= min current + min current*bit value '12-3-10
        N18=1     'use bit value of 1 and 4.7 Kohm for 1.25 ma  '12-3-10
        N17=0     'N17,16,15 Phase Current for Set 1            '12-3-10
        N16=0     'current= min current + min current*bit value '12-3-10
        N15=1     'use bit value of 1 and 4.7 Kohm for 1.25 ma  '12-3-10
```

What this does is change the PLL charge pump current from 5 ma to 1.25 ma. In very early MSA designs, the 5 ma worked very well using the National Semi PLL chip, LMX2325. I was never able to test using the ADF4112 series. I just "assumed" it would be ok. Guess not!!!!!
Scotty
--- On Sat, 6/18/11, Jim Hontoria <jghalpha@...> wrote:

From: Jim Hontoria <jghalpha@gmail.com>
Subject: Re: [spectrumanalyzer] MSA oscillation
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, June 18, 2011, 9:46 AM

Hi Mark,
Yes I have the 4112s (with the famous extra resistor in place). I also have the latest software so I don't think that the bug fix made it to this one. After you mentioned it, I seem to recall now reading something about all this so I'm going to check the yahoo site mail and see if I find something. Any info you may have is greatly appreciated.

Jim W1JGH

On Sat, Jun 18, 2011 at 10:13 AM, Mark Burgin <mark@mburgin.co.uk> wrote:

Hi Jim
I had exactly the same problem. I bet you are using the adf4112 or adf4113 chip rather than the LMX2326. The adf411X chips seem to default to a higher output current than the LMX 2326 which increases the loop gain causing instability. There was a bug in earlier versions of the software that did not take account of this but I believe that current versions are OK so long as you have the ADF4112 set in the configuration settings.
If you need more information or help let me know and I will tell you what to check.
Mark
From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of jghbeta

Sent: 18 June 2011 14:39
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] MSA oscillation

I have someform of oscillation/ high noise that extends from 0 to about 140 MHz. No signal gets thru even the zero hump disappears. beyond that, there is no noise and I getbnice, sharp clear signals. I just have the MSA running. Any ideas?

This site has become so quiet lately...

Jim W1JGH

--
Jim G. Hontoria

8177. Re: [spectrumanalyzer] MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 15:45:21 UTC
From: Jim Hontoria
Topic: 8171 Message: 8177

I believe now that this maybe strictly a USB issue. My understanding is that Dave completed his coding around end August 2010, therefore, any changes after that may have not been made their way to the USB code in Liberty Basic.
Sam maybe able to shed some light onto this.

Jim W1JGH

On Sat, Jun 18, 2011 at 11:29 AM, william sprowls <wsprowls@...>wrote:

> **
>
>
> Hi Jim,
> If you are using Version 115 (and) using it with Liberty Basic, you can
> just change the code. Go and find the following code:
>
> [Command4112R]'needed:
> rcounter,preselector,phasepolarity,control,Jcontrol,port,LEPLL,contclear ;
> commands AD4112 rcounter
> '[Create4112InitBuffer]'needed:preselector,phasepolarity
> N23=1 'N24,23 prescaler: 0=8, 1=16, 2=32, 3=64
> N22=0 'preselector defaulted to 32
> if preselector =8 then N23=0:N22=0
> if preselector =16 then N23=0:N22=1
> if preselector =64 then N23=1:N22=1
> N21=0 'Power Down Mode, 0=async, 1=sync use 0
> N20=1 'N22,21,20 Phase Current for Set 2
> N19=1 'current= min current + min current*bit value
> N18=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
> N17=1 'N18,17,16 Phase Current for Set 1
> N16=1 'current= min current + min current*bit value
> N15=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
>
> in the above code, change N15 thru N20 to the following:
> N20=0 'N20,19,18 Phase Current for Set 2 '12-3-10
> N19=0 'current= min current + min current*bit value '12-3-10
> N18=1 'use bit value of 1 and 4.7 Kohm for 1.25 ma '12-3-10
> N17=0 'N17,16,15 Phase Current for Set 1 '12-3-10
> N16=0 'current= min current + min current*bit value '12-3-10
> N15=1 'use bit value of 1 and 4.7 Kohm for 1.25 ma '12-3-10
>
> What this does is change the PLL charge pump current from 5 ma to 1.25 ma.
> In very early MSA designs, the 5 ma worked very well using the National Semi
> PLL chip, LMX2325. I was never able to test using the ADF4112 series. I just
> "assumed" it would be ok. Guess not!!!!!

> Scotty
> --- On *Sat, 6/18/11, Jim Hontoria <jghalpha@...>* wrote:
>
>
> From: Jim Hontoria <jghalpha@...>
> Subject: Re: [spectrumanalyzer] MSA oscillation
> To: spectrumanalyzer@yahoogroups.com
> Date: Saturday, June 18, 2011, 9:46 AM
>
>
>
> Hi Mark,
>
> Yes I have the 4112s (with the famous extra resistor in place). I also have
> the latest software so I don't think that the bug fix made it to this one.
> After you mentioned it, I seem to recall now reading something about all
> this so I'm going to check the yahoo site mail and see if I find something.
> Any info you may have is greatly appreciated.
>
> Jim W1JGH
>
> On Sat, Jun 18, 2011 at 10:13 AM, Mark Burgin <mark@...<http://mc/compose?to=mark@...>
> > wrote:
>
> **
>
>
> Hi Jim****
>
> ** **
>
> I had exactly the same problem. I bet you are using the adf4112 or adf4113
> chip rather than the LMX2326. The adf411X chips seem to default to a higher
> output current than the LMX 2326 which increases the loop gain causing
> instability. There was a bug in earlier versions of the software that did
> not take account of this but I believe that current versions are OK so long
> as you have the ADF4112 set in the configuration settings.****
>
> ** **
>
> If you need more information or help let me know and I will tell you what
> to check.****
>
> ** **
>
> ** **
>
> Mark****
>
> ** **

>
> *From:* spectrumanalyzer@yahoogroups.com<http://mc/compose?to=spectrumanalyzer@yahoogrou
ps.com>[mailto:
> spectrumanalyzer@yahoogroups.com<http://mc/compose?to=spectrumanalyzer@yahoogroups.com>]
> *On Behalf Of *jghbeta
> *Sent:* 18 June 2011 14:39
> *To:*
spectrumanalyzer@yahoogroups.com<http://mc/compose?to=spectrumanalyzer@yahoogroups.com>
> *Subject:* [spectrumanalyzer] MSA oscillation****
>
> ** **
>
> ****
>
>
> I have someform of oscillation/ high noise that extends from 0 to about 140
> MHz. No signal gets thru even the zero hump disappears. beyond that, there
> is no noise and I getbnice, sharp clear signals. I just have the MSA
> running. Any ideas?
>
> This site has become so quiet lately...
>
> Jim W1JGH****
>
> ****
>
>
>
>
> --
> Jim G. Hontoria
>
>
>

--
Jim G. Hontoria

8178. VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 15:58:51 UTC
From: inlinebeginner
Topic: 8178 Message: 8178

Sam
I put a photo here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1752124177/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc

1) I did OSL cal, and meausred a 83 ohm resistor, the calculated S11 is -6dB, while measured -12dB. I use ZEDC-15-2B, Minicircuit DC.
2) The curve has glitches, is that because I did not do a phase cal?
3) The curve color looks like not matching the scale color.
Thanks
Lin

8179. Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 16:02:59 UTC
From: Sam
Topic: 8171 Message: 8179

Dave's code was all transferred to my program file, so we don't have a USB branch and a non-USB branch. Scotty's change for the ADF4112 was made about the same time, and both were included in the original beta release of Version 116, Rev. A. So the ADF4112 changes are in all the beta releases through the most recent, which is Rev. D.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> I believe now that this maybe strictly a USB issue. My understanding is that
> Dave completed his coding around end August 2010, therefore, any changes
> after that may have not been made their way to the USB code in Liberty
> Basic.
> Sam maybe able to shed some light onto this.
>
> Jim W1JGH
>
>
> On Sat, Jun 18, 2011 at 11:29 AM, william sprowls <wsprowls@...>wrote:
>
> > **
> >
> >
> > Hi Jim,
> > If you are using Version 115 (and) using it with Liberty Basic, you can
> > just change the code. Go and find the following code:
> >
> > [Command4112R]'needed:
> > rcounter,preselector,phasepolarity,control,Jcontrol,port,LEPLL,contclear ;
> > commands AD4112 rcounter
> > '[Create4112InitBuffer]'needed:preselector,phasepolarity
> > N23=1 'N24,23 prescaler: 0=8, 1=16, 2=32, 3=64
> > N22=0 'preselector defaulted to 32
> > if preselector =8 then N23=0:N22=0
> > if preselector =16 then N23=0:N22=1
> > if preselector =64 then N23=1:N22=1
> > N21=0 'Power Down Mode, 0=async, 1=sync use 0
> > N20=1 'N22,21,20 Phase Current for Set 2
> > N19=1 'current= min current + min current*bit value
> > N18=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
> > N17=1 'N18,17,16 Phase Current for Set 1
> > N16=1 'current= min current + min current*bit value
> > N15=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
> >
> > in the above code, change N15 thru N20 to the following:
> > N20=0 'N20,19,18 Phase Current for Set 2 '12-3-10

> > N19=0 'current= min current + min current*bit value '12-3-10
> > N18=1 'use bit value of 1 and 4.7 Kohm for 1.25 ma '12-3-10
> > N17=0 'N17,16,15 Phase Current for Set 1 '12-3-10
> > N16=0 'current= min current + min current*bit value '12-3-10
> > N15=1 'use bit value of 1 and 4.7 Kohm for 1.25 ma '12-3-10
> >
> > What this does is change the PLL charge pump current from 5 ma to 1.25 ma.
> > In very early MSA designs, the 5 ma worked very well using the National Semi
> > PLL chip, LMX2325. I was never able to test using the ADF4112 series. I just
> > "assumed" it would be ok. Guess not!!!!!
> > Scotty
> > --- On *Sat, 6/18/11, Jim Hontoria <jghalpha@...>* wrote:
> >
> >
> > From: Jim Hontoria <jghalpha@...>
> > Subject: Re: [spectrumanalyzer] MSA oscillation
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Saturday, June 18, 2011, 9:46 AM
> >
> >
> >
> > Hi Mark,
> >
> > Yes I have the 4112s (with the famous extra resistor in place). I also have
> > the latest software so I don't think that the bug fix made it to this one.
> > After you mentioned it, I seem to recall now reading something about all
> > this so I'm going to check the yahoo site mail and see if I find something.
> > Any info you may have is greatly appreciated.
> >
> > Jim W1JGH
> >
> > On Sat, Jun 18, 2011 at 10:13 AM, Mark Burgin <mark@...<http://mc/compose?to=mark@...>
> > > wrote:
> >
> > **
> >
> >
> > Hi Jim****
> >
> > ** **
> >
> > I had exactly the same problem. I bet you are using the adf4112 or adf4113
> > chip rather than the LMX2326. The adf411X chips seem to default to a higher
> > output current than the LMX 2326 which increases the loop gain causing
> > instability. There was a bug in earlier versions of the software that did
> > not take account of this but I believe that current versions are OK so long
> > as you have the ADF4112 set in the configuration settings.****
> >
> > ** **
> >

> > If you need more information or help let me know and I will tell you what
> > to check.****
> >
> > ** **
> >
> > ** **
> >
> > Mark****
> >
> > ** **
> >
> > *From:* spectrumanalyzer@yahoogroups.com<http://mc/compose?to=spectrumanalyzer@yahoogr
oups.com>[mailto:
> >
spectrumanalyzer@yahoogroups.com<http://mc/compose?to=spectrumanalyzer@yahoogroups.com>]
> > *On Behalf Of *jghbeta
> > *Sent:* 18 June 2011 14:39
> > *To:*
spectrumanalyzer@yahoogroups.com<http://mc/compose?to=spectrumanalyzer@yahoogroups.com>
> > *Subject:* [spectrumanalyzer] MSA oscillation****
> >
> > ** **
> >
> > ****
> >
> >
> > I have someform of oscillation/ high noise that extends from 0 to about 140
> > MHz. No signal gets thru even the zero hump disappears. beyond that, there
> > is no noise and I getbnice, sharp clear signals. I just have the MSA
> > running. Any ideas?
> >
> > This site has become so quiet lately...
> >
> > Jim W1JGH****
> >
> > ****
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> > --
> > Jim G. Hontoria
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>
> --
> Jim G. Hontoria

>

8180. Re: [spectrumanalyzer] Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 16:15:13 UTC
From: Jim Hontoria
Topic: 8171 Message: 8180

I understand and I see that there is a single branch of code, which is the way to go. However, I see that Scotty's mods are dated December 2010 whereas the USB code sections appear to be written earlier in August (although they may have been transcribed unchanged to the program at a later date).

Jim W1JGH

On Sat, Jun 18, 2011 at 12:02 PM, Sam <swetterlin@...> wrote:

> **
>
>
> Dave's code was all transferred to my program file, so we don't have a USB
> branch and a non-USB branch. Scotty's change for the ADF4112 was made about
> the same time, and both were included in the original beta release of
> Version 116, Rev. A. So the ADF4112 changes are in all the beta releases
> through the most recent, which is Rev. D.
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...>
> wrote:
> >
> > I believe now that this maybe strictly a USB issue. My understanding is
> that
> > Dave completed his coding around end August 2010, therefore, any changes
> > after that may have not been made their way to the USB code in Liberty
> > Basic.
> > Sam maybe able to shed some light onto this.
> >
> > Jim W1JGH
> >
> >
> > On Sat, Jun 18, 2011 at 11:29 AM, william sprowls <wsprowls@...>wrote:
>
> >
> > > **
> > >
> > >
> > > Hi Jim,
> > > If you are using Version 115 (and) using it with Liberty Basic, you can
> > > just change the code. Go and find the following code:
> > >
> > > [Command4112R]'needed:
> > >
> rcounter,preselector,phasepolarity,control,Jcontrol,port,LEPLL,contclear ;

> > > commands AD4112 rcounter
> > > '[Create4112InitBuffer]'needed:preselector,phasepolarity
> > > N23=1 'N24,23 prescaler: 0=8, 1=16, 2=32, 3=64
> > > N22=0 'preselector defaulted to 32
> > > if preselector =8 then N23=0:N22=0
> > > if preselector =16 then N23=0:N22=1
> > > if preselector =64 then N23=1:N22=1
> > > N21=0 'Power Down Mode, 0=async, 1=sync use 0
> > > N20=1 'N22,21,20 Phase Current for Set 2
> > > N19=1 'current= min current + min current*bit value
> > > N18=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
> > > N17=1 'N18,17,16 Phase Current for Set 1
> > > N16=1 'current= min current + min current*bit value
> > > N15=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
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> > > in the above code, change N15 thru N20 to the following:
> > > N20=0 'N20,19,18 Phase Current for Set 2 '12-3-10
> > > N19=0 'current= min current + min current*bit value '12-3-10
> > > N18=1 'use bit value of 1 and 4.7 Kohm for 1.25 ma '12-3-10
> > > N17=0 'N17,16,15 Phase Current for Set 1 '12-3-10
> > > N16=0 'current= min current + min current*bit value '12-3-10
> > > N15=1 'use bit value of 1 and 4.7 Kohm for 1.25 ma '12-3-10
> > >
> > > What this does is change the PLL charge pump current from 5 ma to 1.25
> ma.
> > > In very early MSA designs, the 5 ma worked very well using the National
> Semi
> > > PLL chip, LMX2325. I was never able to test using the ADF4112 series. I
> just
> > > "assumed" it would be ok. Guess not!!!!!
> > > Scotty
> > > --- On *Sat, 6/18/11, Jim Hontoria <jghalpha@...>* wrote:
> > >
> > >
> > > From: Jim Hontoria <jghalpha@...>
>
> > > Subject: Re: [spectrumanalyzer] MSA oscillation
> > > To: spectrumanalyzer@yahoogroups.com
> > > Date: Saturday, June 18, 2011, 9:46 AM
> > >
> > >
> > >
> > > Hi Mark,
> > >
> > > Yes I have the 4112s (with the famous extra resistor in place). I also
> have
> > > the latest software so I don't think that the bug fix made it to this
> one.
> > > After you mentioned it, I seem to recall now reading something about
> all

> > > this so I'm going to check the yahoo site mail and see if I find
> something.
> > > Any info you may have is greatly appreciated.
> > >
> > > Jim W1JGH
> > >
> > > On Sat, Jun 18, 2011 at 10:13 AM, Mark Burgin <mark@...<
> http://mc/compose?to=mark@...>
>
> > > > wrote:
> > >
> > > **
> > >
> > >
> > > Hi Jim****
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> > >
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> > > chip rather than the LMX2326. The adf411X chips seem to default to a
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> > > output current than the LMX 2326 which increases the loop gain causing
> > > instability. There was a bug in earlier versions of the software that
> did
> > > not take account of this but I believe that current versions are OK so
> long
> > > as you have the ADF4112 set in the configuration settings.****
> > >
> > > ** **
> > >
> > > If you need more information or help let me know and I will tell you
> what
> > > to check.****
> > >
> > > ** **
> > >
> > > ** **
> > >
> > > Mark****
> > >
> > > ** **
> > >
> > > *From:* spectrumanalyzer@yahoogroups.com<
> http://mc/compose?to=spectrumanalyzer@yahoogroups.com>[mailto:
> > > spectrumanalyzer@yahoogroups.com<
> http://mc/compose?to=spectrumanalyzer@yahoogroups.com>]
>
> > > *On Behalf Of *jghbeta
> > > *Sent:* 18 June 2011 14:39

> > > *To:* spectrumanalyzer@yahoogroups.com<
> http://mc/compose?to=spectrumanalyzer@yahoogroups.com>
>
> > > *Subject:* [spectrumanalyzer] MSA oscillation****
> > >
> > > ** **
> > >
> > > ****
> > >
> > >
> > > I have someform of oscillation/ high noise that extends from 0 to about
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> > > MHz. No signal gets thru even the zero hump disappears. beyond that,
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> > > is no noise and I getbnice, sharp clear signals. I just have the MSA
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> > > ****
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> > > --
> > > Jim G. Hontoria
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> > --
> > Jim G. Hontoria
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Jim G. Hontoria

8181. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 16:53:07 UTC
From: inlinebeginner
Topic: 8178 Message: 8181

I think my calculation was wrong, the return loss should be -12dB for a 83 ohm resistor load.
Lin

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> I put a photo here:
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1752124177/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
>
> 1) I did OSL cal, and meausred a 83 ohm resistor, the calculated S11 is -6dB, while measured -12dB. I use ZEDC-15-2B, Minicircuit DC.
> 2) The curve has glitches, is that because I did not do a phase cal?
> 3) The curve color looks like not matching the scale color.
> Thanks
> Lin
>

8182. Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 17:16:52 UTC
From: Sam
Topic: 8171 Message: 8182

The dates of the two changes aren't exactly the same, but they were both incorporated into version 116 Rev. A before it was released.

In the next version, the PLL listings will be clearer. There will be an entry for "2326,4118" and another for "4112,4113". (Internally, the software still codes these as simply 2326 and 4112.)

For the present, you should be sure you have selected "4112".

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> I understand and I see that there is a single branch of code, which is the
> way to go. However, I see that Scotty's mods are dated December 2010 whereas
> the USB code sections appear to be written earlier in August (although they
> may have been transcribed unchanged to the program at a later date).
>
> Jim W1JGH
>
> On Sat, Jun 18, 2011 at 12:02 PM, Sam <swetterlin@...> wrote:
>
> > **
> >
> >
> > Dave's code was all transferred to my program file, so we don't have a USB
> > branch and a non-USB branch. Scotty's change for the ADF4112 was made about
> > the same time, and both were included in the original beta release of
> > Version 116, Rev. A. So the ADF4112 changes are in all the beta releases
> > through the most recent, which is Rev. D.
> > Sam W.
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@>
> > wrote:
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> > > I believe now that this maybe strictly a USB issue. My understanding is
> > that
> > > Dave completed his coding around end August 2010, therefore, any changes
> > > after that may have not been made their way to the USB code in Liberty
> > > Basic.
> > > Sam maybe able to shed some light onto this.
> > >
> > > Jim W1JGH
> > >
> > >

> > > On Sat, Jun 18, 2011 at 11:29 AM, william sprowls <wsprowls@>wrote:
> >
> > >
> > > > **
> > > >
> > > >
> > > > Hi Jim,
> > > > If you are using Version 115 (and) using it with Liberty Basic, you can
> > > > just change the code. Go and find the following code:
> > > >
> > > > [Command4112R]'needed:
> > > >
> > rcounter,preselector,phasepolarity,control,Jcontrol,port,LEPLL,contclear ;
> > > > commands AD4112 rcounter
> > > > '[Create4112InitBuffer]'needed:preselector,phasepolarity
> > > > N23=1 'N24,23 prescaler: 0=8, 1=16, 2=32, 3=64
> > > > N22=0 'preselector defaulted to 32
> > > > if preselector =8 then N23=0:N22=0
> > > > if preselector =16 then N23=0:N22=1
> > > > if preselector =64 then N23=1:N22=1
> > > > N21=0 'Power Down Mode, 0=async, 1=sync use 0
> > > > N20=1 'N22,21,20 Phase Current for Set 2
> > > > N19=1 'current= min current + min current*bit value
> > > > N18=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
> > > > N17=1 'N18,17,16 Phase Current for Set 1
> > > > N16=1 'current= min current + min current*bit value
> > > > N15=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
> > > >
> > > > in the above code, change N15 thru N20 to the following:
> > > > N20=0 'N20,19,18 Phase Current for Set 2 '12-3-10
> > > > N19=0 'current= min current + min current*bit value '12-3-10
> > > > N18=1 'use bit value of 1 and 4.7 Kohm for 1.25 ma '12-3-10
> > > > N17=0 'N17,16,15 Phase Current for Set 1 '12-3-10
> > > > N16=0 'current= min current + min current*bit value '12-3-10
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> > > >
> > > > What this does is change the PLL charge pump current from 5 ma to 1.25
> > ma.
> > > > In very early MSA designs, the 5 ma worked very well using the National
> > Semi
> > > > PLL chip, LMX2325. I was never able to test using the ADF4112 series. I
> > just
> > > > "assumed" it would be ok. Guess not!!!!!
> > > > Scotty
> > > > --- On *Sat, 6/18/11, Jim Hontoria <jghalpha@>* wrote:
> > > >
> > > >
> > > > From: Jim Hontoria <jghalpha@>
> >
> > > > Subject: Re: [spectrumanalyzer] MSA oscillation

> > > > To: spectrumanalyzer@yahoogroups.com
> > > > Date: Saturday, June 18, 2011, 9:46 AM
> > > >
> > > >
> > > >
> > > > Hi Mark,
> > > >
> > > > Yes I have the 4112s (with the famous extra resistor in place). I also
> > have
> > > > the latest software so I don't think that the bug fix made it to this
> > one.
> > > > After you mentioned it, I seem to recall now reading something about
> > all
> > > > this so I'm going to check the yahoo site mail and see if I find
> > something.
> > > > Any info you may have is greatly appreciated.
> > > >
> > > > Jim W1JGH
> > > >
> > > > On Sat, Jun 18, 2011 at 10:13 AM, Mark Burgin <mark@<
> > http://mc/compose?to=mark@>
> >
> > > > > wrote:
> > > >
> > > > **
> > > >
> > > >
> > > > Hi Jim****
> > > >
> > > > ** **
> > > >
> > > > I had exactly the same problem. I bet you are using the adf4112 or
> > adf4113
> > > > chip rather than the LMX2326. The adf411X chips seem to default to a
> > higher
> > > > output current than the LMX 2326 which increases the loop gain causing
> > > > instability. There was a bug in earlier versions of the software that
> > did
> > > > not take account of this but I believe that current versions are OK so
> > long
> > > > as you have the ADF4112 set in the configuration settings.****
> > > >
> > > > ** **
> > > >
> > > > If you need more information or help let me know and I will tell you
> > what
> > > > to check.****
> > > >
> > > > ** **
> > > >

> > > > ** **
> > > >
> > > > Mark****
> > > >
> > > > ** **
> > > >
> > > > *From:* spectrumanalyzer@yahoogroups.com<
> > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>[mailto:
> > > > spectrumanalyzer@yahoogroups.com<
> > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>]
> >
> > > > *On Behalf Of *jghbeta
> > > > *Sent:* 18 June 2011 14:39
> > > > *To:* spectrumanalyzer@yahoogroups.com<
> > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>
> >
> > > > *Subject:* [spectrumanalyzer] MSA oscillation****
> > > > >
> > > > ** **
> > > > >
> > > > ****
> > > > >
> > > > >
> > > > I have someform of oscillation/ high noise that extends from 0 to about
> > 140
> > > > MHz. No signal gets thru even the zero hump disappears. beyond that,
> > there
> > > > is no noise and I getbnice, sharp clear signals. I just have the MSA
> > > > running. Any ideas?
> > > > >
> > > > This site has become so quiet lately...
> > > > >
> > > > Jim W1JGH****
> > > > >
> > > > ****
> > > > >
> > > > >
> > > > >
> > > > >
> > > > --
> > > > Jim G. Hontoria
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> > > --
> > > Jim G. Hontoria
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> --
> Jim G. Hontoria
>

8183. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 17:36:27 UTC
From: Sam
Topic: 8178 Message: 8183

By not having done phase cal, do you mean you haven't calibrated the PDM inversion? That could definitely distort the measurement. I also note that your wait time is 0, which rarely gives good results in Reflection mode. Any glitch that occurs during the O, S or L calibrations will show up in every subsequent measurement, along with any glitch that arises in the measurement itself. Use Auto Wait or at least 20 ms wait time even for the wide video filter.

The color of very thin lines on a sharply contrasting background is not accurate on some monitors, and also gets distorted in jpegs. For compression, it is better to use .png files, which are accurate and are also very compact when the picture contains broad areas of flat color. (.tif files are good too, but I don't think Yahoo lets you upload them.) When I do use jpegs, I have gotten best results by using a dark brown rather than black background (to reduce the contrast), and using double-width graph lines.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> I think my calculation was wrong, the return loss should be -12dB for a 83 ohm resistor load.
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Sam
> > I put a photo here:
> > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1752124177/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> >
> > 1) I did OSL cal, and meausred a 83 ohm resistor, the calculated S11 is -6dB, while measured -12dB. I use ZEDC-15-2B, Minicircuit DC.
> > 2) The curve has glitches, is that because I did not do a phase cal?
> > 3) The curve color looks like not matching the scale color.
> > Thanks
> > Lin
> >
>

8184. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 17:49:48 UTC
From: Sam
Topic: 8178 Message: 8184

On closer look, it appears that the graph colors are not simply distorted, but rather the phase and magnitude appear to be reversed. Try adding a marker to confirm which line is which. Is it possible your OSL cal was done incorrectly, such as reversing the O and S standards? Also, when you use a directional coupler as a bridge, be sure you hook it up in "reverse"--i.e. TG output goes to DC "out", DUT is connected to DC "in" and MSA input is connected to DC "CPL".
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> By not having done phase cal, do you mean you haven't calibrated the PDM inversion? That could definitely distort the measurement. I also note that your wait time is 0, which rarely gives good results in Reflection mode. Any glitch that occurs during the O, S or L calibrations will show up in every subsequent measurement, along with any glitch that arises in the measurement itself. Use Auto Wait or at least 20 ms wait time even for the wide video filter.
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> The color of very thin lines on a sharply contrasting background is not accurate on some monitors, and also gets distorted in jpegs. For compression, it is better to use .png files, which are accurate and are also very compact when the picture contains broad areas of flat color. (.tif files are good too, but I don't think Yahoo lets you upload them.) When I do use jpegs, I have gotten best results by using a dark brown rather than black background (to reduce the contrast), and using double-width graph lines.
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> > > Sam
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> > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1752124177/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
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> > > 1) I did OSL cal, and meausred a 83 ohm resistor, the calculated S11 is -6dB, while measured -12dB. I use ZEDC-15-2B, Minicircuit DC.
> > > 2) The curve has glitches, is that because I did not do a phase cal?
> > > 3) The curve color looks like not matching the scale color.
> > > Thanks
> > > Lin

> > >
> >
>

8185. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 17:50:17 UTC
From: inlinebeginner
Topic: 8178 Message: 8185

Sam
Thanks for the infor, I will try it soon. Before that I'd like to know how can I recall the OSL cal data from what I saved.
Lin
--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> By not having done phase cal, do you mean you haven't calibrated the PDM inversion? That could definitely distort the measurement. I also note that your wait time is 0, which rarely gives good results in Reflection mode. Any glitch that occurs during the O, S or L calibrations will show up in every subsequent measurement, along with any glitch that arises in the measurement itself. Use Auto Wait or at least 20 ms wait time even for the wide video filter.
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> > > 3) The curve color looks like not matching the scale color.
> > > Thanks
> > > Lin
> > >
> >
>

8186. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 18:04:11 UTC
From: inlinebeginner
Topic: 8178 Message: 8186

For the color, If you look at the curve and scale:
Scale Curve
Deg: Yellow Blue
Mag: Blue Yellow

When the Deg and Mag has a similar curve, you will read the blue curve and try to find the blue scale, and give us a wrong number. If we can make the color match like this:

Scale Curve
Deg: Blue Blue
Mag: Yellow Yellow

It may be easier to read the curve.

Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> Thanks for the infor, I will try it soon. Before that I'd like to know how can I recall the OSL cal data from what I saved.
> Lin
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > By not having done phase cal, do you mean you haven't calibrated the PDM inversion? That could definitely distort the measurement. I also note that your wait time is 0, which rarely gives good results in Reflection mode. Any glitch that occurs during the O, S or L calibrations will show up in every subsequent measurement, along with any glitch that arises in the measurement itself. Use Auto Wait or at least 20 ms wait time even for the wide video filter.
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> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > >
> > > I think my calculation was wrong, the return loss should be -12dB for a 83 ohm resistor load.
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> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
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> > > > Thanks
> > > > Lin
> > > >
> > >
> >
>

8187. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 19:14:19 UTC
From: Sam
Topic: 8178 Message: 8187

The colors of the lines are supposed to match the color of the scale in the way you describe. I have not encountered a situation where they did not match. Did you perhaps change the Primary Axis settings? That is the only thing I can imagine that might switch the colors (though it shouldn't).

If you place a marker, the marker readings will also indicate which curve goes with which axis. Or you can use the Data menu to display the graph data, which will show all the values for magnitude and phase, which will tell you which line is which. Finally, the Smith chart graph will be in the same color as the magnitude graph.

I suspect that the blue curve is in fact magnitude, which means your readings are very far from what they should be. That's why I suspected an error in the OSL calibration procedure or in the hookup of the DC.

You can't recreate the OSL info from what you saved. You will have to re-do the OSL calibration. There is a Save Debug Info item in the File menu that allows you to save and then reload enough info to recreate the state of the software, but it is intended for basic debugging, hasn't proven all that useful and has not been updated to include OSL info. If you want to save OSL info you can select OSL Info in the Data menu, and then save the displayed data, but there is no way to reload it.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> For the color, If you look at the curve and scale:
> Scale Curve
> Deg: Yellow Blue
> Mag: Blue Yellow
>
> When the Deg and Mag has a similar curve, you will read the blue curve and try to find the blue scale, and give us a wrong number. If we can make the color match like this:
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> Scale Curve
> Deg: Blue Blue
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> It may be easier to read the curve.
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> Thanks
> Lin
>
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> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
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> > Sam
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> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > > By not having done phase cal, do you mean you haven't calibrated the PDM inversion? That could definitely distort the measurement. I also note that your wait time is 0, which rarely gives good results in Reflection mode. Any glitch that occurs during the O, S or L calibrations will show up in every subsequent measurement, along with any glitch that arises in the measurement itself. Use Auto Wait or at least 20 ms wait time even for the wide video filter.
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> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
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> > > > I think my calculation was wrong, the return loss should be -12dB for a 83 ohm resistor load.
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> > > >
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> > > > > 1) I did OSL cal, and meausred a 83 ohm resistor, the calculated S11 is -6dB, while measured -12dB. I use ZEDC-15-2B, Minicircuit DC.
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> > > > > Thanks
> > > > > Lin
> > > > >
> > > >
> > >
> >
>

8188. Re: [spectrumanalyzer] Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 20:32:45 UTC
From: Jim Hontoria
Topic: 8171 Message: 8188

Ok. So it is not the USB software, unless that section of the code anyway. The 0 -140 MHz noise/oscillation problem still remains. Any takers on this one?

Jim W1JGH

On Sat, Jun 18, 2011 at 1:16 PM, Sam <swetterlin@comcast.net> wrote:

> **
>
>
> The dates of the two changes aren't exactly the same, but they were both
> incorporated into version 116 Rev. A before it was released.
>
> In the next version, the PLL listings will be clearer. There will be an
> entry for "2326,4118" and another for "4112,4113". (Internally, the software
> still codes these as simply 2326 and 4112.)
>
> For the present, you should be sure you have selected "4112".
>
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...>
> wrote:
> >
> > I understand and I see that there is a single branch of code, which is
> the
> > way to go. However, I see that Scotty's mods are dated December 2010
> whereas
> > the USB code sections appear to be written earlier in August (although
> they
> > may have been transcribed unchanged to the program at a later date).
> >
> > Jim W1JGH
> >
> > On Sat, Jun 18, 2011 at 12:02 PM, Sam <swetterlin@...> wrote:
> >
> > > **
> > >
> > >
> > > Dave's code was all transferred to my program file, so we don't have a
> USB
> > > branch and a non-USB branch. Scotty's change for the ADF4112 was made
> about
> > > the same time, and both were included in the original beta release of

> > > Version 116, Rev. A. So the ADF4112 changes are in all the beta
> releases
> > > through the most recent, which is Rev. D.
> > > Sam W.
> > >
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@>
> > > wrote:
> > > >
> > > > I believe now that this maybe strictly a USB issue. My understanding
> is
> > > that
> > > > Dave completed his coding around end August 2010, therefore, any
> changes
> > > > after that may have not been made their way to the USB code in
> Liberty
> > > > Basic.
> > > > Sam maybe able to shed some light onto this.
> > > >
> > > > Jim W1JGH
> > > >
> > > >
> > > > On Sat, Jun 18, 2011 at 11:29 AM, william sprowls <wsprowls@>wrote:
> > >
> > > >
> > > > > **
> > > > >
> > > > >
> > > > > Hi Jim,
> > > > > If you are using Version 115 (and) using it with Liberty Basic, you
> can
> > > > > just change the code. Go and find the following code:
> > > > >
> > > > > [Command4112R]'needed:
> > > > >
> > >
> rcounter,preselector,phasepolarity,control,Jcontrol,port,LEPLL,contclear ;
> > > > > commands AD4112 rcounter
> > > > > '[Create4112InitBuffer]'needed:preselector,phasepolarity
> > > > > N23=1 'N24,23 prescaler: 0=8, 1=16, 2=32, 3=64
> > > > > N22=0 'preselector defaulted to 32
> > > > > if preselector =8 then N23=0:N22=0
> > > > > if preselector =16 then N23=0:N22=1
> > > > > if preselector =64 then N23=1:N22=1
> > > > > N21=0 'Power Down Mode, 0=async, 1=sync use 0
> > > > > N20=1 'N22,21,20 Phase Current for Set 2
> > > > > N19=1 'current= min current + min current*bit value
> > > > > N18=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
> > > > > N17=1 'N18,17,16 Phase Current for Set 1
> > > > > N16=1 'current= min current + min current*bit value

> > > > > N15=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
> > > > >
> > > > > in the above code, change N15 thru N20 to the following:
> > > > > N20=0 'N20,19,18 Phase Current for Set 2 '12-3-10
> > > > > N19=0 'current= min current + min current*bit value '12-3-10
> > > > > N18=1 'use bit value of 1 and 4.7 Kohm for 1.25 ma '12-3-10
> > > > > N17=0 'N17,16,15 Phase Current for Set 1 '12-3-10
> > > > > N16=0 'current= min current + min current*bit value '12-3-10
> > > > > N15=1 'use bit value of 1 and 4.7 Kohm for 1.25 ma '12-3-10
> > > > > >
> > > > > What this does is change the PLL charge pump current from 5 ma to
> 1.25
> > > ma.
> > > > > In very early MSA designs, the 5 ma worked very well using the
> National
> > > Semi
> > > > > PLL chip, LMX2325. I was never able to test using the ADF4112
> series. I
> > > just
> > > > > "assumed" it would be ok. Guess not!!!!!
> > > > > Scotty
> > > > > --- On *Sat, 6/18/11, Jim Hontoria <jghalpha@>* wrote:
> > > > > >
> > > > > >
> > > > > From: Jim Hontoria <jghalpha@>
> > > >
> > > > > Subject: Re: [spectrumanalyzer] MSA oscillation
> > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > Date: Saturday, June 18, 2011, 9:46 AM
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> > > > > >
> > > > > >
> > > > > Hi Mark,
> > > > > >
> > > > > Yes I have the 4112s (with the famous extra resistor in place). I
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> > > > > the latest software so I don't think that the bug fix made it to
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> > > one.
> > > > > After you mentioned it, I seem to recall now reading something
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> > > > > Jim W1JGH
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> > > > > On Sat, Jun 18, 2011 at 10:13 AM, Mark Burgin <mark@<

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> > > > > > wrote:
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> > > > > chip rather than the LMX2326. The adf411X chips seem to default to
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> > > > > output current than the LMX 2326 which increases the loop gain
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> > > long
> > > > > as you have the ADF4112 set in the configuration settings.****
> > > > >
> > > > > ** **
> > > > >
> > > > > If you need more information or help let me know and I will tell
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> > > > > to check.****
> > > > >
> > > > > ** **
> > > > >
> > > > > ** **
> > > > >
> > > > > Mark****
> > > > >
> > > > > ** **
> > > > >
> > > > > *From:* spectrumanalyzer@yahoogroups.com<
> > > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>[mailto:
> > > > > spectrumanalyzer@yahoogroups.com<
> > > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>]
> > >
> > > > > *On Behalf Of *jghbeta
> > > > > *Sent:* 18 June 2011 14:39
> > > > > *To:* spectrumanalyzer@yahoogroups.com<
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> > > > > *Subject:* [spectrumanalyzer] MSA oscillation****
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> > > > >
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> > > > >
> > > > > Jim W1JGH****
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> > > > > Jim G. Hontoria
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> > > > Jim G. Hontoria
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> > Jim G. Hontoria
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Jim G. Hontoria

8189. RE: [spectrumanalyzer] Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 20:50:52 UTC
From: Mark Burgin
Topic: 8171 Message: 8189

HI Jim
I'm pretty certain that your problem is caused by too much gain in the PLO loop. As I said, for me it was caused by the bug in handling the 4112 but it seems that you have eliminated that as a possibility. When it happened to me, it was very similar to your problem. It was noisy up to about 190MHz and fine at higher frequencies. Look for messages on the groups dated around 2nd Dec. 2010 with title "Software changes needed to support the ADF4112/ADF4113 in PLO1 and PLO2" to see the discussions.
I suppose there are several other things that could cause the gain to be too high. Have you double checked the values of R23 (the curent setting resistor), R1, R2 and C1. Any of these being wrong could cause the issue. Are you using the recommended ROS-2150VW VCO?
Good luck
Mark

From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of Jim Hontoria
Sent: 18 June 2011 21:33
To: spectrumanalyzer@yahoogroups.com
Subject: Re: [spectrumanalyzer] Re: MSA oscillation

Ok. So it is not the USB software, unless that section of the code anyway.
The 0 -140 MHz noise/oscillation problem still remains. Any takers on this one?

Jim W1JGH

On Sat, Jun 18, 2011 at 1:16 PM, Sam <swetterlin@...<mailto:swetterlin@comcast.net>> wrote:

The dates of the two changes aren't exactly the same, but they were both incorporated into version 116 Rev. A before it was released.

In the next version, the PLL listings will be clearer. There will be an entry for "2326,4118" and another for "4112,4113". (Internally, the software still codes these as simply 2326 and 4112.)

For the present, you should be sure you have selected "4112".

Sam W.

--- In spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>, Jim Hontoria <jghalpha@...> wrote:
>
> I understand and I see that there is a single branch of code, which is the
> way to go. However, I see that Scotty's mods are dated December 2010 whereas
> the USB code sections appear to be written earlier in August (although they
> may have been transcribed unchanged to the program at a later date).
>
> Jim W1JGH

>
> On Sat, Jun 18, 2011 at 12:02 PM, Sam <swetterlin@...> wrote:
>
> > **
> >
> >
> > Dave's code was all transferred to my program file, so we don't have a USB
> > branch and a non-USB branch. Scotty's change for the ADF4112 was made about
> > the same time, and both were included in the original beta release of
> > Version 116, Rev. A. So the ADF4112 changes are in all the beta releases
> > through the most recent, which is Rev. D.
> > Sam W.
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>,
Jim Hontoria <jghalpha@>
> > wrote:
> > >
> > > I believe now that this maybe strictly a USB issue. My understanding is
> > that
> > > Dave completed his coding around end August 2010, therefore, any changes
> > > after that may have not been made their way to the USB code in Liberty
> > > Basic.
> > > Sam maybe able to shed some light onto this.
> > >
> > > Jim W1JGH
> > >
> > >
> > > On Sat, Jun 18, 2011 at 11:29 AM, william sprowls <wsprowls@>wrote:
> >
> > >
> > > > **
> > > >
> > > >
> > > > Hi Jim,
> > > > If you are using Version 115 (and) using it with Liberty Basic, you can
> > > > just change the code. Go and find the following code:
> > > >
> > > > [Command4112R]'needed:
> > > >
> > rcounter,preselector,phasepolarity,control,Jcontrol,port,LEPLL,contclear ;
> > > > commands AD4112 rcounter
> > > > '[Create4112InitBuffer]'needed:preselector,phasepolarity
> > > > N23=1 'N24,23 prescaler: 0=8, 1=16, 2=32, 3=64
> > > > N22=0 'preselector defaulted to 32
> > > > if preselector =8 then N23=0:N22=0
> > > > if preselector =16 then N23=0:N22=1
> > > > if preselector =64 then N23=1:N22=1
> > > > N21=0 'Power Down Mode, 0=async, 1=sync use 0
> > > > N20=1 'N22,21,20 Phase Current for Set 2

> > > > N19=1 'current= min current + min current*bit value
> > > > N18=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
> > > > N17=1 'N18,17,16 Phase Current for Set 1
> > > > N16=1 'current= min current + min current*bit value
> > > > N15=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
> > > >
> > > > in the above code, change N15 thru N20 to the following:
> > > > N20=0 'N20,19,18 Phase Current for Set 2 '12-3-10
> > > > N19=0 'current= min current + min current*bit value '12-3-10
> > > > N18=1 'use bit value of 1 and 4.7 Kohm for 1.25 ma '12-3-10
> > > > N17=0 'N17,16,15 Phase Current for Set 1 '12-3-10
> > > > N16=0 'current= min current + min current*bit value '12-3-10
> > > > N15=1 'use bit value of 1 and 4.7 Kohm for 1.25 ma '12-3-10
> > > >
> > > > What this does is change the PLL charge pump current from 5 ma to 1.25
> > ma.
> > > > In very early MSA designs, the 5 ma worked very well using the National
> > Semi
> > > > PLL chip, LMX2325. I was never able to test using the ADF4112 series. I
> > just
> > > > "assumed" it would be ok. Guess not!!!!!
> > > > Scotty
> > > > --- On *Sat, 6/18/11, Jim Hontoria <jghalpha@>* wrote:
> > > >
> > > >
> > > > From: Jim Hontoria <jghalpha@>
> >
> > > > Subject: Re: [spectrumanalyzer] MSA oscillation
> > > > To: spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>
> > > > Date: Saturday, June 18, 2011, 9:46 AM
> > > >
> > > >
> > > >
> > > > Hi Mark,
> > > >
> > > > Yes I have the 4112s (with the famous extra resistor in place). I also
> > have
> > > > the latest software so I don't think that the bug fix made it to this
> > one.
> > > > After you mentioned it, I seem to recall now reading something about
> > all
> > > > this so I'm going to check the yahoo site mail and see if I find
> > something.
> > > > Any info you may have is greatly appreciated.
> > > >
> > > > Jim W1JGH
> > > >
> > > > On Sat, Jun 18, 2011 at 10:13 AM, Mark Burgin <mark@<
> > http://mc/compose?to=mark@>
> >

> > > > > wrote:
> > > >
> > > > **
> > > >
> > > >
> > > > Hi Jim****
> > > >
> > > > ** **
> > > >
> > > > I had exactly the same problem. I bet you are using the adf4112 or
> > adf4113
> > > > chip rather than the LMX2326. The adf411X chips seem to default to a
> > higher
> > > > output current than the LMX 2326 which increases the loop gain causing
> > > > instability. There was a bug in earlier versions of the software that
> > did
> > > > not take account of this but I believe that current versions are OK so
> > long
> > > > as you have the ADF4112 set in the configuration settings.****
> > > >
> > > > ** **
> > > >
> > > > If you need more information or help let me know and I will tell you
> > what
> > > > to check.****
> > > >
> > > > ** **
> > > >
> > > > ** **
> > > >
> > > > Mark****
> > > >
> > > > ** **
> > > >
> > > > *From:*
spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com><
> > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>[mailto:
> > > > spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com><
> > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>]
> >
> > > > *On Behalf Of *jghbeta
> > > > *Sent:* 18 June 2011 14:39
> > > > *To:* spectrumanalyzer@...m<mailto:spectrumanalyzer%40yahoogroups.com><
> > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>
> >
> > > > *Subject:* [spectrumanalyzer] MSA oscillation****
> > > >
> > > > ** **
> > > >
> > > > ****

> > > >
> > > >
> > > > I have someform of oscillation/ high noise that extends from 0 to about
> > 140
> > > > MHz. No signal gets thru even the zero hump disappears. beyond that,
> > there
> > > > is no noise and I getbnice, sharp clear signals. I just have the MSA
> > > > running. Any ideas?
> > > >
> > > > This site has become so quiet lately...
> > > >
> > > > Jim W1JGH****
> > > >
> > > > ****
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> > > > Jim G. Hontoria
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> Jim G. Hontoria
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Jim G. Hontoria

8190. Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 21:09:23 UTC
From: Sam
Topic: 8171 Message: 8190

Jim,
Have you verified that a PLL is indeed producing erratic output when it should be at a fixed frequency, or is the symptom simply disappearance of graph data below 140 MHz?
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Mark Burgin <mark@...> wrote:
>
> HI Jim
> I'm pretty certain that your problem is caused by too much gain in the PLO loop. As I said, for me it was caused by the bug in handling the 4112 but it seems that you have eliminated that as a possibility. When it happened to me, it was very similar to your problem. It was noisy up to about 190MHz and fine at higher frequencies. Look for messages on the groups dated around 2nd Dec. 2010 with title "Software changes needed to support the ADF4112/ADF4113 in PLO1 and PLO2" to see the discussions.
> I suppose there are several other things that could cause the gain to be too high. Have you double checked the values of R23 (the curent setting resistor), R1, R2 and C1. Any of these being wrong could cause the issue. Are you using the recommended ROS-2150VW VCO?
> Good luck
> Mark
>
> From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of Jim Hontoria
> Sent: 18 June 2011 21:33
> To: spectrumanalyzer@yahoogroups.com
> Subject: Re: [spectrumanalyzer] Re: MSA oscillation
>
>
>
> Ok. So it is not the USB software, unless that section of the code anyway.
> The 0 -140 MHz noise/oscillation problem still remains. Any takers on this one?
>
> Jim W1JGH
>
>
> On Sat, Jun 18, 2011 at 1:16 PM, Sam <swetterlin@...<mailto:swetterlin@...>> wrote:
>
>
> The dates of the two changes aren't exactly the same, but they were both incorporated into version 116 Rev. A before it was released.
>
> In the next version, the PLL listings will be clearer. There will be an entry for "2326,4118" and another for "4112,4113". (Internally, the software still codes these as simply 2326 and 4112.)
>
> For the present, you should be sure you have selected "4112".

>
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>, Jim Hontoria <jghalpha@> wrote:
> >
> > I understand and I see that there is a single branch of code, which is the
> > way to go. However, I see that Scotty's mods are dated December 2010 whereas
> > the USB code sections appear to be written earlier in August (although they
> > may have been transcribed unchanged to the program at a later date).
> >
> > Jim W1JGH
> >
> > On Sat, Jun 18, 2011 at 12:02 PM, Sam <swetterlin@> wrote:
> >
> > > **
> > >
> > >
> > > Dave's code was all transferred to my program file, so we don't have a USB
> > > branch and a non-USB branch. Scotty's change for the ADF4112 was made about
> > > the same time, and both were included in the original beta release of
> > > Version 116, Rev. A. So the ADF4112 changes are in all the beta releases
> > > through the most recent, which is Rev. D.
> > > Sam W.
> > >
> > >

8191. Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 21:12:54 UTC
From: Sam
Topic: 8171 Message: 8191

Also, I understood that your MSA was working with the parallel port and with USB through the control board, so this problem manifested itself only with direct USB control of the modules. True?
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Jim,
> Have you verified that a PLL is indeed producing erratic output when it should be at a fixed frequency, or is the symptom simply disappearance of graph data below 140 MHz?
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Mark Burgin <mark@> wrote:
> >
> > HI Jim
> > I'm pretty certain that your problem is caused by too much gain in the PLO loop. As I said, for me it was caused by the bug in handling the 4112 but it seems that you have eliminated that as a possibility. When it happened to me, it was very similar to your problem. It was noisy up to about 190MHz and fine at higher frequencies. Look for messages on the groups dated around 2nd Dec. 2010 with title "Software changes needed to support the ADF4112/ADF4113 in PLO1 and PLO2" to see the discussions.
> > I suppose there are several other things that could cause the gain to be too high. Have you double checked the values of R23 (the curent setting resistor), R1, R2 and C1. Any of these being wrong could cause the issue. Are you using the recommended ROS-2150VW VCO?
> > Good luck
> > Mark
> >
> > From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of Jim Hontoria
> > Sent: 18 June 2011 21:33
> > To: spectrumanalyzer@yahoogroups.com
> > Subject: Re: [spectrumanalyzer] Re: MSA oscillation
> >
> >
> >
> > Ok. So it is not the USB software, unless that section of the code anyway.
> > The 0 -140 MHz noise/oscillation problem still remains. Any takers on this one?
> >
> > Jim W1JGH
> >
> >
> > On Sat, Jun 18, 2011 at 1:16 PM, Sam <swetterlin@<mailto:swetterlin@>> wrote:
> >
> >
> > The dates of the two changes aren't exactly the same, but they were both incorporated

into version 116 Rev. A before it was released.
> >
> > In the next version, the PLL listings will be clearer. There will be an entry for "2326,4118" and another for "4112,4113". (Internally, the software still codes these as simply 2326 and 4112.)
> >
> > For the present, you should be sure you have selected "4112".
> >
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>, Jim Hontoria <jghalpha@> wrote:
> > >
> > > I understand and I see that there is a single branch of code, which is the
> > > way to go. However, I see that Scotty's mods are dated December 2010 whereas
> > > the USB code sections appear to be written earlier in August (although they
> > > may have been transcribed unchanged to the program at a later date).
> > >
> > > Jim W1JGH
> > >
> > > On Sat, Jun 18, 2011 at 12:02 PM, Sam <swetterlin@> wrote:
> > >
> > > > **
> > > >
> > > >
> > > > Dave's code was all transferred to my program file, so we don't have a USB
> > > > branch and a non-USB branch. Scotty's change for the ADF4112 was made about
> > > > the same time, and both were included in the original beta release of
> > > > Version 116, Rev. A. So the ADF4112 changes are in all the beta releases
> > > > through the most recent, which is Rev. D.
> > > > Sam W.
> > > >
> > > >
>

8192. Re: [spectrumanalyzer] Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 23:00:20 UTC
From: Jim Hontoria
Topic: 8171 Message: 8192

True. BUT:
1. I always had some dirty floor in the low frequencies. Up to the 200 MHz area. After that there was a clear improvement in the response (similar to what Scotty mentions about the mismatch of the cavity filter that is supposed to be resolved with a series cap+resistor in the mixer output).
2. This never was to the extent of loosing signals or even the zero response hump.
3. I see a lot of noise in the log detector output that is not present at the input. I am exploring this area as we speak.

Jim W1JGH

On Sat, Jun 18, 2011 at 5:12 PM, Sam <swetterlin@...> wrote:

> **
>
>
> Also, I understood that your MSA was working with the parallel port and
> with USB through the control board, so this problem manifested itself only
> with direct USB control of the modules. True?
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
> >
> > Jim,
> > Have you verified that a PLL is indeed producing erratic output when it
> should be at a fixed frequency, or is the symptom simply disappearance of
> graph data below 140 MHz?
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, Mark Burgin <mark@> wrote:
> > >
> > > HI Jim
> > > I'm pretty certain that your problem is caused by too much gain in the
> PLO loop. As I said, for me it was caused by the bug in handling the 4112
> but it seems that you have eliminated that as a possibility. When it
> happened to me, it was very similar to your problem. It was noisy up to
> about 190MHz and fine at higher frequencies. Look for messages on the groups
> dated around 2nd Dec. 2010 with title "Software changes needed to support
> the ADF4112/ADF4113 in PLO1 and PLO2" to see the discussions.
> > > I suppose there are several other things that could cause the gain to
> be too high. Have you double checked the values of R23 (the curent setting
> resistor), R1, R2 and C1. Any of these being wrong could cause the issue.
> Are you using the recommended ROS-2150VW VCO?
> > > Good luck

> > > Mark
> > >
> > > From: spectrumanalyzer@yahoogroups.com [mailto:
> spectrumanalyzer@yahoogroups.com] On Behalf Of Jim Hontoria
> > > Sent: 18 June 2011 21:33
> > > To: spectrumanalyzer@yahoogroups.com
> > > Subject: Re: [spectrumanalyzer] Re: MSA oscillation
> > >
> > >
> > >
> > > Ok. So it is not the USB software, unless that section of the code
> anyway.
> > > The 0 -140 MHz noise/oscillation problem still remains. Any takers on
> this one?
> > >
> > > Jim W1JGH
> > >
> > >
> > > On Sat, Jun 18, 2011 at 1:16 PM, Sam <swetterlin@<mailto:swetterlin@>>
> wrote:
> > >
> > >
> > > The dates of the two changes aren't exactly the same, but they were
> both incorporated into version 116 Rev. A before it was released.
> > >
> > > In the next version, the PLL listings will be clearer. There will be an
> entry for "2326,4118" and another for "4112,4113". (Internally, the software
> still codes these as simply 2326 and 4112.)
> > >
> > > For the present, you should be sure you have selected "4112".
> > >
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com<mailto:
> spectrumanalyzer%40yahoogroups.com>, Jim Hontoria <jghalpha@> wrote:
> > > >
> > > > I understand and I see that there is a single branch of code, which
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> > > > way to go. However, I see that Scotty's mods are dated December 2010
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> > > > the USB code sections appear to be written earlier in August
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> > > > may have been transcribed unchanged to the program at a later date).
> > > >
> > > > Jim W1JGH
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> > > > On Sat, Jun 18, 2011 at 12:02 PM, Sam <swetterlin@> wrote:
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> > > > >
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> > > > > Dave's code was all transferred to my program file, so we don't
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> > > > > through the most recent, which is Rev. D.
> > > > > Sam W.
> > > > >
> > > > >
> >
>
>
>

--
Jim G. Hontoria

8193. Re: [spectrumanalyzer] Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-18 23:04:15 UTC
From: Jim Hontoria
Topic: 8171 Message: 8193

Sam,
I missed your previous email. A fixed frequency (0 span) does not change anything, the magnitude does not change and it shows the same amount of noise (the noise can be cleaned with the video filter though).

Jim W1JGH

On Sat, Jun 18, 2011 at 7:00 PM, Jim Hontoria <jghalpha@...> wrote:

> True. BUT:
> 1. I always had some dirty floor in the low frequencies. Up to the 200 MHz
> area. After that there was a clear improvement in the response (similar to
> what Scotty mentions about the mismatch of the cavity filter that is
> supposed to be resolved with a series cap+resistor in the mixer output).
> 2. This never was to the extent of loosing signals or even the zero
> response hump.
> 3. I see a lot of noise in the log detector output that is not present at
> the input. I am exploring this area as we speak.
>
> Jim W1JGH
>
>
> On Sat, Jun 18, 2011 at 5:12 PM, Sam <swetterlin@comcast.net> wrote:
>
>> **
>>
>>
>> Also, I understood that your MSA was working with the parallel port and
>> with USB through the control board, so this problem manifested itself only
>> with direct USB control of the modules. True?
>> Sam W.
>>
>>
>> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>> >
>> > Jim,
>> > Have you verified that a PLL is indeed producing erratic output when it
>> should be at a fixed frequency, or is the symptom simply disappearance of
>> graph data below 140 MHz?
>> > Sam W.
>> >
>> > --- In spectrumanalyzer@yahoogroups.com, Mark Burgin <mark@> wrote:
>> > >
>> > > HI Jim
>> > > I'm pretty certain that your problem is caused by too much gain in the
>> PLO loop. As I said, for me it was caused by the bug in handling the 4112

>> but it seems that you have eliminated that as a possibility. When it
>> happened to me, it was very similar to your problem. It was noisy up to
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>> > > I suppose there are several other things that could cause the gain to
>> be too high. Have you double checked the values of R23 (the curent setting
>> resistor), R1, R2 and C1. Any of these being wrong could cause the issue.
>> Are you using the recommended ROS-2150VW VCO?
>> > > Good luck
>> > > Mark
>> > >
>> > > From: spectrumanalyzer@yahoogroups.com [mailto:
>> spectrumanalyzer@yahoogroups.com] On Behalf Of Jim Hontoria
>> > > Sent: 18 June 2011 21:33
>> > > To: spectrumanalyzer@yahoogroups.com
>> > > Subject: Re: [spectrumanalyzer] Re: MSA oscillation
>> > >
>> > >
>> > >
>> > > Ok. So it is not the USB software, unless that section of the code
>> anyway.
>> > > The 0 -140 MHz noise/oscillation problem still remains. Any takers on
>> this one?
>> > >
>> > > Jim W1JGH
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>> > >
>> > > On Sat, Jun 18, 2011 at 1:16 PM, Sam <swetterlin@<mailto:swetterlin@>>
>> wrote:
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>> > > The dates of the two changes aren't exactly the same, but they were
>> both incorporated into version 116 Rev. A before it was released.
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>> > > In the next version, the PLL listings will be clearer. There will be
>> an entry for "2326,4118" and another for "4112,4113". (Internally, the
>> software still codes these as simply 2326 and 4112.)
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>> > > For the present, you should be sure you have selected "4112".
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>> > > Sam W.
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>> > > --- In spectrumanalyzer@yahoogroups.com<mailto:
>> spectrumanalyzer%40yahoogroups.com>, Jim Hontoria <jghalpha@> wrote:
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>> (although they
>> > > > may have been transcribed unchanged to the program at a later date).
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> Jim G. Hontoria
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Jim G. Hontoria

8194. Re: [spectrumanalyzer] Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-19 00:00:07 UTC
From: Jim Hontoria
Topic: 8171 Message: 8194

Well,
It might have been the log detector. The poor thing seems to have just died.
I hope it was painful.

Jim W1JGH

On Sat, Jun 18, 2011 at 7:04 PM, Jim Hontoria <jghalpha@...> wrote:

> Sam,
> I missed your previous email. A fixed frequency (0 span) does not change
> anything, the magnitude does not change and it shows the same amount of
> noise (the noise can be cleaned with the video filter though).
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> Jim W1JGH
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> On Sat, Jun 18, 2011 at 7:00 PM, Jim Hontoria <jghalpha@...> wrote:
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>> True. BUT:
>> 1. I always had some dirty floor in the low frequencies. Up to the 200 MHz
>> area. After that there was a clear improvement in the response (similar to
>> what Scotty mentions about the mismatch of the cavity filter that is
>> supposed to be resolved with a series cap+resistor in the mixer output).
>> 2. This never was to the extent of loosing signals or even the zero
>> response hump.
>> 3. I see a lot of noise in the log detector output that is not present at
>> the input. I am exploring this area as we speak.
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>> Jim W1JGH
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>>
>> On Sat, Jun 18, 2011 at 5:12 PM, Sam <swetterlin@comcast.net> wrote:
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>>> **
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>>> Also, I understood that your MSA was working with the parallel port and
>>> with USB through the control board, so this problem manifested itself only
>>> with direct USB control of the modules. True?
>>> Sam W.
>>>
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>>> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>>> >
>>> > Jim,
>>> > Have you verified that a PLL is indeed producing erratic output when it

>>> should be at a fixed frequency, or is the symptom simply disappearance of
>>> graph data below 140 MHz?
>>> > Sam W.
>>> >
>>> > --- In spectrumanalyzer@...m, Mark Burgin <mark@> wrote:
>>> > >
>>> > > HI Jim
>>> > > I'm pretty certain that your problem is caused by too much gain in
>>> the PLO loop. As I said, for me it was caused by the bug in handling the
>>> 4112 but it seems that you have eliminated that as a possibility. When it
>>> happened to me, it was very similar to your problem. It was noisy up to
>>> about 190MHz and fine at higher frequencies. Look for messages on the groups
>>> dated around 2nd Dec. 2010 with title "Software changes needed to support
>>> the ADF4112/ADF4113 in PLO1 and PLO2" to see the discussions.
>>> > > I suppose there are several other things that could cause the gain to
>>> be too high. Have you double checked the values of R23 (the curent setting
>>> resistor), R1, R2 and C1. Any of these being wrong could cause the issue.
>>> Are you using the recommended ROS-2150VW VCO?
>>> > > Good luck
>>> > > Mark
>>> > >
>>> > > From: spectrumanalyzer@yahoogroups.com [mailto:
>>> spectrumanalyzer@yahoogroups.com] On Behalf Of Jim Hontoria
>>> > > Sent: 18 June 2011 21:33
>>> > > To: spectrumanalyzer@yahoogroups.com
>>> > > Subject: Re: [spectrumanalyzer] Re: MSA oscillation
>>> > >
>>> > >
>>> > >
>>> > > Ok. So it is not the USB software, unless that section of the code
>>> anyway.
>>> > > The 0 -140 MHz noise/oscillation problem still remains. Any takers on
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>>> > >
>>> > > Jim W1JGH
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>>> > > On Sat, Jun 18, 2011 at 1:16 PM, Sam <swetterlin@<mailto:swetterlin@>>
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>>> > > The dates of the two changes aren't exactly the same, but they were
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>>> > > In the next version, the PLL listings will be clearer. There will be
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Jim G. Hontoria

8195. Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-19 13:37:38 UTC
From: Sam
Topic: 8171 Message: 8195

The log detector does not seem a likely culprit because its response is unaffected by the frequency the MSA is tuned to. Your loss of signal at low frequency also seems different from the "dirty floor", since the latter is actually an "excess signal" (probably cavity filter leakage). If possible, check the PLO1 output with a fixed frequency scan, or a slowly moving scan. Also check that PLO2 is fixed at 1024 MHz.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> Well,
> It might have been the log detector. The poor thing seems to have just died.
> I hope it was painful.
>
> Jim W1JGH
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> On Sat, Jun 18, 2011 at 7:04 PM, Jim Hontoria <jghalpha@...> wrote:
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> > Sam,
> > I missed your previous email. A fixed frequency (0 span) does not change
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> >> True. BUT:
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> >>> Also, I understood that your MSA was working with the parallel port and
> >>> with USB through the control board, so this problem manifested itself only
> >>> with direct USB control of the modules. True?
> >>> Sam W.
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> >>> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> >>> > Jim,
> >>> > Have you verified that a PLL is indeed producing erratic output when it
> >>> should be at a fixed frequency, or is the symptom simply disappearance of
> >>> graph data below 140 MHz?
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> >>> resistor), R1, R2 and C1. Any of these being wrong could cause the issue.
> >>> Are you using the recommended ROS-2150VW VCO?
> >>> > > Good luck
> >>> > > Mark
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> >>> spectrumanalyzer@yahoogroups.com] On Behalf Of Jim Hontoria
> >>> > > Sent: 18 June 2011 21:33
> >>> > > To: spectrumanalyzer@yahoogroups.com
> >>> > > Subject: Re: [spectrumanalyzer] Re: MSA oscillation
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8196. Re: [spectrumanalyzer] Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-19 14:13:03 UTC
From: Jim Hontoria
Topic: 8171 Message: 8196

While rebuilding my log detector I notice that there is a 0.001 cap (C13) at its output.. In addition, the input pin of the ADC has C12 (C21 for the phase ADC) , of the same size. Both caps are in parallel with the video filters. Should their value be added to that of the filter caps in the Configuration Table?

Jim W1JGH

On Sat, Jun 18, 2011 at 8:00 PM, Jim Hontoria <jghalpha@...> wrote:

> Well,
> It might have been the log detector. The poor thing seems to have just
> died. I hope it was painful.
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>>> supposed to be resolved with a series cap+resistor in the mixer output).
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8197. Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-19 14:45:59 UTC
From: Sam
Topic: 8171 Message: 8197

Theoretically, yes, but it will make no difference if you do so. The only exception is that when there is no video filter cap, the software doesn't like to have a zero value, but it will fudge the value itself. The video filter cap values are used only for fairly crude calculations, such as how long to wait after inverting the PDM. Those calculations are done conservatively so small errors in cap values have no practical effect.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> While rebuilding my log detector I notice that there is a 0.001 cap (C13) at
> its output.. In addition, the input pin of the ADC has C12 (C21 for the
> phase ADC) , of the same size. Both caps are in parallel with the video
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8198. Confusion concerning using DDS 3 as a tracking generator

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-19 16:34:00 UTC
From: Mark Burgin
Topic: 8198 Message: 8198

Hi all
I have just started building up the modules for the TG and VNA. My basic SA is complete and works fine. The first TG module I have completed is DDS3. I tested it and it appeared to work well and so I though I would try using DDS3 as a tracking generator to characterise a filter.
However, whenever I click on "Command DDS 3" or "DDS 3 Track", the spectrum ananlyzer display changes to a noisy flat line along the bottom of the display. For example, I have the SA set to sweep from 0 to 1MHz so that I can see the zero response hump on the display. If I then open the special tests window and set DDS 3 to 5 MHz and click on "Command DDS 3", and then "Continue" the scan, I just get a noisy flat line at -100db or so. If I Check the DDS 3 output with a scope, it has correctly been set to 5MHz.
I have had a look at the digital command signals to DDS 1 and 3 on a scope and they all look very clean and so it doesn't look like a crosstalk problem with the control signals.
I can understand that if I use DDS 1 as a tracking generator, normal SA functionality would be upset, but I can't understand why SA functionality is broken by using DDS 3 as the generator. What am I doing wrong?
Thanks
Mark

8199. Re: [spectrumanalyzer] Confusion concerning using DDS 3 as a tracking generator

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-19 17:38:07 UTC
From: SFC
Topic: 8198 Message: 8199

Hi,

Funny, I noticed the same behaviour. I have used the dds3 for scanning my narrow filter but now it doesn't seem to work anymore. I'll try an older version of the software to see if that will work...

On the site there is a mention of: Primary Function: Enabled
but I can't seem to find that button

Simon

----- Original Message -----
From: Mark Burgin
To: spectrumanalyzer@yahoogroups.com
Sent: Sunday, June 19, 2011 6:34 PM
Subject: [spectrumanalyzer] Confusion concerning using DDS 3 as a tracking generator

Hi all

I have just started building up the modules for the TG and VNA. My basic SA is complete and works fine. The first TG module I have completed is DDS3. I tested it and it appeared to work well and so I though I would try using DDS3 as a tracking generator to characterise a filter.

However, whenever I click on "Command DDS 3" or "DDS 3 Track", the spectrum ananlyzer display changes to a noisy flat line along the bottom of the display. For example, I have the SA set to sweep from 0 to 1MHz so that I can see the zero response hump on the display. If I then open the special tests window and set DDS 3 to 5 MHz and click on "Command DDS 3", and then "Continue" the scan, I just get a noisy flat line at -100db or so. If I Check the DDS 3 output with a scope, it has correctly been set to 5MHz.

I have had a look at the digital command signals to DDS 1 and 3 on a scope and they all look very clean and so it doesn't look like a crosstalk problem with the control signals.

I can understand that if I use DDS 1 as a tracking generator, normal SA functionality would be upset, but I can't understand why SA functionality is broken by using DDS 3 as the generator. What am I doing wrong?

Thanks

Mark

_____ NOD32 6221 (20110619) Informatie _____

Dit bericht is gecontroleerd door het NOD32 Antivirus Systeem.
http://www.nod32.nl

8200. Re: [spectrumanalyzer] Confusion concerning using DDS 3 as a tracking generator

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-19 20:42:16 UTC
From: william sprowls
Topic: 8198 Message: 8200

Hi Mark,
 You are doing nothing wrong. Version 115 Rev G works as it should. There seems to be a software bug starting with the first beta release of Version 116. I'll get Sam involved.
Scotty

--- On Sun, 6/19/11, Mark Burgin <mark@...> wrote:

From: Mark Burgin <mark@...>
Subject: [spectrumanalyzer] Confusion concerning using DDS 3 as a tracking generator
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Sunday, June 19, 2011, 11:34 AM

Hi allI have just started building up the modules for the TG and VNA. My basic SA is complete and works fine. The first TG module I have completed is DDS3. I tested it and it appeared to work well and so I though I would try using DDS3 as a tracking generator to characterise a filter.However, whenever I click on "Command DDS 3" or "DDS 3 Track", the spectrum ananlyzer display changes to a noisy flat line along the bottom of the display. For example, I have the SA set to sweep from 0 to 1MHz so that I can see the zero response hump on the display. If I then open the special tests window and set DDS 3 to 5 MHz and click on "Command DDS 3", and then "Continue" the scan, I just get a noisy flat line at -100db or so. If I Check the DDS 3 output with a scope, it has correctly been set to 5MHz.I have had a look at the digital command signals to DDS 1 and 3 on a scope and they all look very clean and so it doesn't look like a crosstalk problem
with the control signals.I can understand that if I use DDS 1 as a tracking generator, normal SA functionality would be upset, but I can't understand why SA functionality is broken by using DDS 3 as the generator. What am I doing wrong?ThanksMark

8201. Re: Confusion concerning using DDS 3 as a tracking generator

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-19 22:01:01 UTC
From: Sam
Topic: 8198 Message: 8201

That was an obscure one. The error occurred between 116-2a and 116-3a, whose changes all involved USB fixes. But in the course of those changes, a carriage return got deleted in [CreateCmdAllArray], which created this line:

end if 'USB:05/12/2010 thisstep = rememberthisstep

The second half of that line is supposed to be a free-standing command, but instead it got incorporated into the comment of the "end if" line. The next release will fix this, but if you want to fix your code, search for the above line and replace it with:

end if 'USB:05/12/2010
thisstep = rememberthisstep

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Mark,
> Â You are doing nothing wrong. Version 115 Rev G works as it should. There seems to be a software bug starting with the first beta release of Version 116. I'll get Sam involved.
> Scotty
>
> --- On Sun, 6/19/11, Mark Burgin <mark@...> wrote:
>
> From: Mark Burgin <mark@...>
> Subject: [spectrumanalyzer] Confusion concerning using DDS 3 as a tracking generator
> To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
> Date: Sunday, June 19, 2011, 11:34 AM
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> with the control signals.I can understand that if I use DDS 1 as a tracking generator, normal SA functionality would be upset, but I can't understand why SA functionality is broken by using DDS 3 as the generator.Â What am I doing wrong?ThanksMark
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8202. RE: [spectrumanalyzer] Re: Confusion concerning using DDS 3 as a tracking generator

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-19 22:47:17 UTC
From: Mark Burgin
Topic: 8198 Message: 8202

Thanks Sam, Scotty and Simon for your very quick responses. If only commercial organisations could be as responsive as this when it comes to fixing bugs!

Mark

From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of Sam
Sent: 19 June 2011 23:01
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Re: Confusion concerning using DDS 3 as a tracking generator

That was an obscure one. The error occurred between 116-2a and 116-3a, whose changes all involved USB fixes. But in the course of those changes, a carriage return got deleted in [CreateCmdAllArray], which created this line:

end if 'USB:05/12/2010 thisstep = rememberthisstep

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end if 'USB:05/12/2010
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Sam W.

--- In spectrumanalyzer@...m<mailto:spectrumanalyzer%40yahoogroups.com>, william sprowls <wsprowls@...> wrote:
>
> Hi Mark,
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> Scotty
>
> --- On Sun, 6/19/11, Mark Burgin <mark@...> wrote:
>
> From: Mark Burgin <mark@...>
> Subject: [spectrumanalyzer] Confusion concerning using DDS 3 as a tracking generator
> To: "spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>" <spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>>
> Date: Sunday, June 19, 2011, 11:34 AM
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> with the control signals.I can understand that if I use DDS 1 as a tracking generator, normal SA functionality would be upset, but I can't understand why SA functionality is broken by using DDS 3 as the generator.Â What am I doing wrong?ThanksMark
>

8203. Re: Confusion concerning using DDS 3 as a tracking generator

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-19 23:58:20 UTC
From: Sam
Topic: 8198 Message: 8203

That's why we get paid the big bucks!
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Mark Burgin <mark@...> wrote:
>
> Thanks Sam, Scotty and Simon for your very quick responses. If only commercial organisations could be as responsive as this when it comes to fixing bugs!
>
> Mark
>
> From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of Sam
> Sent: 19 June 2011 23:01
> To: spectrumanalyzer@yahoogroups.com
> Subject: [spectrumanalyzer] Re: Confusion concerning using DDS 3 as a tracking generator
>
>
>
> That was an obscure one. The error occurred between 116-2a and 116-3a, whose changes all involved USB fixes. But in the course of those changes, a carriage return got deleted in [CreateCmdAllArray], which created this line:
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> The second half of that line is supposed to be a free-standing command, but instead it got incorporated into the comment of the "end if" line. The next release will fix this, but if you want to fix your code, search for the above line and replace it with:
>
> end if 'USB:05/12/2010
> thisstep = rememberthisstep
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>, william sprowls <wsprowls@> wrote:
> >
> > Hi Mark,
> > Â You are doing nothing wrong. Version 115 Rev G works as it should. There seems to be a software bug starting with the first beta release of Version 116. I'll get Sam involved.
> > Scotty
> >
> > --- On Sun, 6/19/11, Mark Burgin <mark@> wrote:
> >
> > From: Mark Burgin <mark@>
> > Subject: [spectrumanalyzer] Confusion concerning using DDS 3 as a tracking generator

> > To: "spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>" <spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>>
> > Date: Sunday, June 19, 2011, 11:34 AM
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> >
>

8204. Re: [spectrumanalyzer] Re: Confusion concerning using DDS 3 as a tracking generator

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-20 01:35:59 UTC
From: william sprowls
Topic: 8198 Message: 8204

I spend all of my profits on cat food. Anybody want two cats?
Scotty

--- On Sun, 6/19/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@comcast.net>
Subject: [spectrumanalyzer] Re: Confusion concerning using DDS 3 as a tracking generator
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, June 19, 2011, 6:58 PM

That's why we get paid the big bucks!

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Mark Burgin <mark@...> wrote:

>

> Thanks Sam, Scotty and Simon for your very quick responses. If only commercial organisations could be as responsive as this when it comes to fixing bugs!

>

> Mark

>

> From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of Sam

> Sent: 19 June 2011 23:01

> To: spectrumanalyzer@yahoogroups.com

> Subject: [spectrumanalyzer] Re: Confusion concerning using DDS 3 as a tracking generator

>

>

>

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> end if 'USB:05/12/2010

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> Sam W.

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> --- In spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>, william sprowls <wsprowls@> wrote:

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> > Hi Mark,

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> > Scotty

> >

> > --- On Sun, 6/19/11, Mark Burgin <mark@> wrote:

> >

> > From: Mark Burgin <mark@>

> > Subject: [spectrumanalyzer] Confusion concerning using DDS 3 as a tracking generator

> > To: "spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>" <spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>>

> > Date: Sunday, June 19, 2011, 11:34 AM

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> >

>

8205. 3G Band Phase Polarity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-20 04:14:25 UTC
From: forbes3100
Topic: 8205 Message: 8205

While we're fixing code I may have a couple more for you:

1) Check the phase polarity in 3G mode-- is it my hardware? Or is it inverted?

2) A *very* minor fix: the CrystalParameters routine will fail its test (if un-commented-out) due to Fdb3A and Fdb3B not being on either side of Fs. The BW is right so the rest of the test passes. I see these were derived from Jack Smith's methodology 3 test. Fdb3A=20.014599, Fdb3B=20.016655 will work fine.

--Scott

8206. Re: [spectrumanalyzer] Re: Confusion concerning using DDS 3 as a tracking generator

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-20 13:33:06 UTC
From: D. J. Wang
Topic: 8198 Message: 8206

It's gonna be a mess if you don't have enough dough left for cat litters..
DJ

_____
From: william sprowls <wsprowls@yahoo.com>
To: spectrumanalyzer@yahoogroups.com
Sent: Sun, June 19, 2011 9:35:59 PM
Subject: Re: [spectrumanalyzer] Re: Confusion concerning using DDS 3 as a tracking generator

I spend all of my profits on cat food. Anybody want two cats?
Scotty

--- On Sun, 6/19/11, Sam <swetterlin@...> wrote:

>From: Sam <swetterlin@...>
>Subject: [spectrumanalyzer] Re: Confusion concerning using DDS 3 as a tracking
>generator
>To: spectrumanalyzer@yahoogroups.com
>Date: Sunday, June 19, 2011, 6:58 PM
>
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>
>That's why we get paid the big bucks!
>Sam W.
>
>--- In spectrumanalyzer@yahoogroups.com, Mark Burgin <mark@...> wrote:
>>
>> Thanks Sam, Scotty and Simon for your very quick responses. If only commercial
>>organisations could be as responsive as this when it comes to fixing bugs!
>>
>> Mark
>>
>> From: spectrumanalyzer@yahoogroups.com
>>[mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of Sam
>> Sent: 19 June 2011 23:01
>> To: spectrumanalyzer@yahoogroups.com
>> Subject: [spectrumanalyzer] Re: Confusion concerning using DDS 3 as a tracking
>>generator
>>
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>> That was an obscure one. The error occurred between 116-2a and 116-3a, whose
>>changes all involved USB fixes. But in the course of those changes, a carriage
>>return got deleted in [CreateCmdAllArray], which created this line:

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>> end if 'USB:05/12/2010 thisstep = rememberthisstep
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>> The second half of that line is supposed to be a free-standing command, but
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>> end if 'USB:05/12/2010
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>> Sam W.
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>> --- In
>>spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>,
>>william sprowls <wsprowls@> wrote:
>> >
>> > Hi Mark,
>> > Â You are doing nothing wrong. Version 115 Rev G works as it should. There
>>seems to be a software bug starting with the first beta release of Version 116.
>>I'll get Sam involved.
>> > Scotty
>> >
>> > --- On Sun, 6/19/11, Mark Burgin <mark@> wrote:
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>> > From: Mark Burgin <mark@>
>> > Subject: [spectrumanalyzer] Confusion concerning using DDS 3 as a tracking
>>generator
>> > To:
>>"spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>"
>><spectrumanalyzer@yahoogroups.com<mailto:spectrumanalyzer%40yahoogroups.com>>
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>>generator, normal SA functionality would be upset, but I can't understand why SA
>>functionality is broken by using DDS 3 as the generator.Â What am I doing
>>wrong?ThanksMark
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8207. Re: 3G Band Phase Polarity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-20 15:24:56 UTC
From: Sam
Topic: 8205 Message: 8207

You are correct on 3G phase polarity if using released version 115. This is fixed in all the version 116 betas.

I don't follow the Crystal Parameters bug. Are you saying it claims it can't find the 3 dB points even when they are actually there?

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "forbes3100" <forbes3100@...> wrote:
>
> While we're fixing code I may have a couple more for you:
>
> 1) Check the phase polarity in 3G mode-- is it my hardware? Or is it inverted?
>
> 2) A *very* minor fix: the CrystalParameters routine will fail its test (if un-commented-out) due to Fdb3A and Fdb3B not being on either side of Fs. The BW is right so the rest of the test passes. I see these were derived from Jack Smith's methodology 3 test. Fdb3A=20.014599, Fdb3B=20.016655 will work fine.
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> --Scott
>

8208. Re: [spectrumanalyzer] Re: Confusion concerning using DDS 3 as a tracking generator

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-20 16:40:32 UTC
From: SFC
Topic: 8198 Message: 8208

Hi,

Made the changes and all is working perfect now!!

Simon

----- Original Message -----
From: Sam
To: spectrumanalyzer@yahoogroups.com
Sent: Monday, June 20, 2011 12:01 AM
Subject: [spectrumanalyzer] Re: Confusion concerning using DDS 3 as a tracking generator

That was an obscure one. The error occurred between 116-2a and 116-3a, whose changes all involved USB fixes. But in the course of those changes, a carriage return got deleted in [CreateCmdAllArray], which created this line:

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Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
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> Hi Mark,
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> Scotty
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> --- On Sun, 6/19/11, Mark Burgin <mark@...> wrote:
>
> From: Mark Burgin <mark@...>
> Subject: [spectrumanalyzer] Confusion concerning using DDS 3 as a tracking generator
> To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
> Date: Sunday, June 19, 2011, 11:34 AM
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_____ NOD32 6221 (20110619) Informatie _____

Dit bericht is gecontroleerd door het NOD32 Antivirus Systeem.
http://www.nod32.nl

8209. Re: [spectrumanalyzer] Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-20 16:48:56 UTC
From: SFC
Topic: 8171 Message: 8209

Hi,

I had a similair problem but on a other frequency. The TG signal would dip at around 350mhz (zcomm vco's and home made pcb). I added two more by-pass caps, 0.1uF, on the powersupply trace just after the fb to the vco's and the problem went away. Nice straight line now....

Simon

----- Original Message -----
From: Sam
To: spectrumanalyzer@yahoogroups.com
Sent: Sunday, June 19, 2011 3:37 PM
Subject: [spectrumanalyzer] Re: MSA oscillation

The log detector does not seem a likely culprit because its response is unaffected by the frequency the MSA is tuned to. Your loss of signal at low frequency also seems different from the "dirty floor", since the latter is actually an "excess signal" (probably cavity filter leakage). If possible, check the PLO1 output with a fixed frequency scan, or a slowly moving scan. Also check that PLO2 is fixed at 1024 MHz.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> Well,
> It might have been the log detector. The poor thing seems to have just died.
> I hope it was painful.
>
> Jim W1JGH
>
> On Sat, Jun 18, 2011 at 7:04 PM, Jim Hontoria <jghalpha@...> wrote:
>
> > Sam,
> > I missed your previous email. A fixed frequency (0 span) does not change
> > anything, the magnitude does not change and it shows the same amount of
> > noise (the noise can be cleaned with the video filter though).
> >
> > Jim W1JGH
> >
> >
> > On Sat, Jun 18, 2011 at 7:00 PM, Jim Hontoria <jghalpha@...> wrote:
> >
> >> True. BUT:
> >> 1. I always had some dirty floor in the low frequencies. Up to the 200 MHz
> >> area. After that there was a clear improvement in the response (similar to
> >> what Scotty mentions about the mismatch of the cavity filter that is
> >> supposed to be resolved with a series cap+resistor in the mixer output).

> >> 2. This never was to the extent of loosing signals or even the zero
> >> response hump.
> >> 3. I see a lot of noise in the log detector output that is not present at
> >> the input. I am exploring this area as we speak.
> >>
> >> Jim W1JGH
> >>
> >>
> >> On Sat, Jun 18, 2011 at 5:12 PM, Sam <swetterlin@...> wrote:
> >>
> >>> **
> >>>
> >>>
> >>> Also, I understood that your MSA was working with the parallel port and
> >>> with USB through the control board, so this problem manifested itself only
> >>> with direct USB control of the modules. True?
> >>> Sam W.
> >>>
> >>>
> >>> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >>> >
> >>> > Jim,
> >>> > Have you verified that a PLL is indeed producing erratic output when it
> >>> should be at a fixed frequency, or is the symptom simply disappearance of
> >>> graph data below 140 MHz?
> >>> > Sam W.
> >>> >
> >>> > --- In spectrumanalyzer@yahoogroups.com, Mark Burgin <mark@> wrote:
> >>> > >
> >>> > > HI Jim
> >>> > > I'm pretty certain that your problem is caused by too much gain in
> >>> the PLO loop. As I said, for me it was caused by the bug in handling the
> >>> 4112 but it seems that you have eliminated that as a possibility. When it
> >>> happened to me, it was very similar to your problem. It was noisy up to
> >>> about 190MHz and fine at higher frequencies. Look for messages on the groups
> >>> dated around 2nd Dec. 2010 with title "Software changes needed to support
> >>> the ADF4112/ADF4113 in PLO1 and PLO2" to see the discussions.
> >>> > > I suppose there are several other things that could cause the gain to
> >>> be too high. Have you double checked the values of R23 (the curent setting
> >>> resistor), R1, R2 and C1. Any of these being wrong could cause the issue.
> >>> Are you using the recommended ROS-2150VW VCO?
> >>> > > Good luck
> >>> > > Mark
> >>> > >
> >>> > > From: spectrumanalyzer@yahoogroups.com [mailto:
> >>> spectrumanalyzer@yahoogroups.com] On Behalf Of Jim Hontoria
> >>> > > Sent: 18 June 2011 21:33
> >>> > > To: spectrumanalyzer@yahoogroups.com
> >>> > > Subject: Re: [spectrumanalyzer] Re: MSA oscillation
> >>> > >

> >>> > >
> >>> > >
> >>> > > Ok. So it is not the USB software, unless that section of the code
> >>> anyway.
> >>> > > The 0 -140 MHz noise/oscillation problem still remains. Any takers on
> >>> this one?
> >>> > >
> >>> > > Jim W1JGH
> >>> > >
> >>> > >
> >>> > > On Sat, Jun 18, 2011 at 1:16 PM, Sam <swetterlin@<mailto:swetterlin@>>
> >>> wrote:
> >>> > >
> >>> > >
> >>> > > The dates of the two changes aren't exactly the same, but they were
> >>> both incorporated into version 116 Rev. A before it was released.
> >>> > >
> >>> > > In the next version, the PLL listings will be clearer. There will be
> >>> an entry for "2326,4118" and another for "4112,4113". (Internally, the
> >>> software still codes these as simply 2326 and 4112.)
> >>> > >
> >>> > > For the present, you should be sure you have selected "4112".
> >>> > >
> >>> > >
> >>> > > Sam W.
> >>> > >
> >>> > > --- In spectrumanalyzer@yahoogroups.com<mailto:
> >>> spectrumanalyzer%40yahoogroups.com>, Jim Hontoria <jghalpha@> wrote:
> >>> > > >
> >>> > > > I understand and I see that there is a single branch of code, which
> >>> is the
> >>> > > > way to go. However, I see that Scotty's mods are dated December
> >>> 2010 whereas
> >>> > > > the USB code sections appear to be written earlier in August
> >>> (although they
> >>> > > > may have been transcribed unchanged to the program at a later
> >>> date).
> >>> > > >
> >>> > > > Jim W1JGH
> >>> > > >
> >>> > > > On Sat, Jun 18, 2011 at 12:02 PM, Sam <swetterlin@> wrote:
> >>> > > >
> >>> > > > > **
> >>> > > > >
> >>> > > > >
> >>> > > > > Dave's code was all transferred to my program file, so we don't
> >>> have a USB
> >>> > > > > branch and a non-USB branch. Scotty's change for the ADF4112 was
> >>> made about
> >>> > > > > the same time, and both were included in the original beta

> >>> release of
> >>> > > > > Version 116, Rev. A. So the ADF4112 changes are in all the beta
> >>> releases
> >>> > > > > through the most recent, which is Rev. D.
> >>> > > > > Sam W.
> >>> > > > >
> >>> > > > >
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> >>
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> >> --
> >> Jim G. Hontoria
> >>
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> > --
> > Jim G. Hontoria
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> --
> Jim G. Hontoria
>

_____ NOD32 6221 (20110619) Informatie _____

Dit bericht is gecontroleerd door het NOD32 Antivirus Systeem.
http://www.nod32.nl

8210. Re: 3G Band Phase Polarity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-20 18:44:53 UTC
From: forbes3100
Topic: 8205 Message: 8210

Good to know it's fixed in 116, thanks.

The CrystalParameters routine itself is good. It's only the test values that are slightly wrong in a way that doesn't matter to the results since the BW is correct, but CrystalParameters is checking for Fdb3A < Fs which isn't true here. I guess the checks were added after the test was commented out.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> You are correct on 3G phase polarity if using released version 115. This is fixed in all the version 116 betas.
>
> I don't follow the Crystal Parameters bug. Are you saying it claims it can't find the 3 dB points even when they are actually there?
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "forbes3100" <forbes3100@> wrote:
> >
> > While we're fixing code I may have a couple more for you:
> >
> > 1) Check the phase polarity in 3G mode-- is it my hardware? Or is it inverted?
> >
> > 2) A *very* minor fix: the CrystalParameters routine will fail its test (if un-commented-out) due to Fdb3A and Fdb3B not being on either side of Fs. The BW is right so the rest of the test passes. I see these were derived from Jack Smith's methodology 3 test. Fdb3A=20.014599, Fdb3B=20.016655 will work fine.
> >
> > --Scott
> >
>

8211. Re: 3G Band Phase Polarity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-20 19:04:09 UTC
From: Sam
Topic: 8205 Message: 8211

OK, now I get it. That test code near the beginning of the program was created long ago and then commented out, and the parameters for the function it calls were subsequently changed. I have now deleted the commented-out test code.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "forbes3100" <forbes3100@...> wrote:
>
> Good to know it's fixed in 116, thanks.
>
> The CrystalParameters routine itself is good. It's only the test values that are slightly wrong in a way that doesn't matter to the results since the BW is correct, but CrystalParameters is checking for Fdb3A < Fs which isn't true here. I guess the checks were added after the test was commented out.
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > You are correct on 3G phase polarity if using released version 115. This is fixed in all the version 116 betas.
> >
> > I don't follow the Crystal Parameters bug. Are you saying it claims it can't find the 3 dB points even when they are actually there?
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "forbes3100" <forbes3100@> wrote:
> > >
> > > While we're fixing code I may have a couple more for you:
> > >
> > > 1) Check the phase polarity in 3G mode-- is it my hardware? Or is it inverted?
> > >
> > > 2) A *very* minor fix: the CrystalParameters routine will fail its test (if un-commented-out) due to Fdb3A and Fdb3B not being on either side of Fs. The BW is right so the rest of the test passes. I see these were derived from Jack Smith's methodology 3 test. Fdb3A=20.014599, Fdb3B=20.016655 will work fine.
> > >
> > > --Scott
> > >
> >
>

8212. Raised noise floor when using DDS 3 at 10.7MHz as a signal source for SA - Poor RF-IF isolation in Mixer 1?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-20 23:01:17 UTC
From: Mark Burgin
Topic: 8212 Message: 8212

Hi Everyone
As I mentioned in a previous posting, I have just built DDS 3 and am trying to use it to measure the performance of one of my resolution filters. Once the software bug was fixed (thanks Sam) everything more or less worked as expected but I noticed one peculiarity which I am unable to fully explain.
If I connect DDS 3 output to the SA input, set DDS 3 to output 10.7MHz, and do a sweep of the SA (any frequency range), I see that the noise floor across the whole band has raised to approx -60dBm. If I disconnect the DD3 output from the SA input, the noise floor returns to less than -100dBm. Or if I tune DDS 3 to a different frequency, 10MHz for example, the noise floor lowers back to its normal place. It seems that the output from DDS 3 is leaking through to the log detector somehow when it is set to the IF frequency. Note that I have not built or connected Mixer 3, Mixer 4, PLO 3 or the Phase Detector - it is just the basic SA + DDS 3 used as the signal source.
I think I understand why this is happening. The DDS output is rich in harmonics and one of them will be at 16 * 64MHz - 10.7Mhz = 1013.3MHz - the 1st IF frequency! If this leaks through Mixer 1, it will eventually appear as a 10.7Mhz signal at the Log Detector. I have confirmed this to some degree since, if I insert a 10.7MHz bandpass filter between DDS 3 output and the SA input eliminating the harmonics, the problem goes away.
But what I don't understand is why the effect is so large. Looking at the data sheet for the ADE-11X, the RF-IF isolation at 1GHz is about 20db. By tuning DDS 3 slightly off 10.7MHz to avoid the noise floor issue, I have measured the amplitude of the (15*64MHz - 10.7MHz) and (14*64MHz - 10.7MHz) harmonics and both are around -55dBm and so, if the 16th harmonic is similar, I would expect that the interference level should be less than -75dBm, but I am see about -60dBm.
Have I just got a bad mixer with poor RF-IF isolation (only about 5dB!) or is there another explanation?
Thanks
Mark

8213. Re: [spectrumanalyzer] Raised noise floor when using DDS 3 at 10.7MHz as a signal source for SA - Poor RF-IF isolation in Mixer 1?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-21 12:09:09 UTC
From: william sprowls
Topic: 8212 Message: 8213

Hi Mark,
 You have your formula almost correct:
16 * 64MHz - 10.7Mhz = 1013.3MHz - the 1st IF frequency
it is really
16 * 64MHz - 10.7Mhz = 1013.3MHz, where 10.7 is the commanded DDS3
This is an alias and very powerful at 1013.3 MHz. This is the configuration when sweeping the cavity filter when the MSA is fully constructed.
  More specifically the formula for the output of the DDS is:
N * 64MHz +/- C, where N is any whole number, and C is the commanded DDS output.
I think your levels are about right.
 Scotty

--- On Mon, 6/20/11, Mark Burgin <mark@...> wrote:

From: Mark Burgin <mark@...>
Subject: [spectrumanalyzer] Raised noise floor when using DDS 3 at 10.7MHz as a signal source for SA - Poor RF-IF isolation in Mixer 1?
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Monday, June 20, 2011, 6:01 PM

Hi EveryoneAs I mentioned in a previous posting, I have just built DDS 3 and am trying to use it to measure the performance of one of my resolution filters. Once the software bug was fixed (thanks Sam) everything more or less worked as expected but I noticed one peculiarity which I am unable to fully explain.If I connect DDS 3 output to the SA input, set DDS 3 to output 10.7MHz, and do a sweep of the SA (any frequency range), I see that the noise floor across the whole band has raised to approx -60dBm. If I disconnect the DD3 output from the SA input, the noise floor returns to less than -100dBm. Or if I tune DDS 3 to a different frequency, 10MHz for example, the noise floor lowers back to its normal place. It seems that the output from DDS 3 is leaking through to the log detector somehow when it is set to the IF frequency. Note that I have not built or connected Mixer 3,
 Mixer 4, PLO 3 or the Phase Detector - it is just the basic SA
+ DDS 3 used as the signal source.I think I understand why this is happening. The DDS output is rich in harmonics and one of them will be at 16 * 64MHz - 10.7Mhz = 1013.3MHz - the 1st IF frequency! If this leaks through Mixer 1, it will eventually appear as a 10.7Mhz signal at the Log Detector. I have confirmed this to some degree since, if I insert a 10.7MHz bandpass filter between DDS 3 output and the SA input eliminating the harmonics, the problem goes away.But what I don't understand is why the effect is so large. Looking at the data sheet for the ADE-11X, the RF-IF isolation at 1GHz is about 20db. By tuning DDS 3 slightly off 10.7MHz to avoid the noise floor issue, I have measured the amplitude of the (15*64MHz - 10.7MHz) and (14*64MHz - 10.7MHz) harmonics and both are around -55dBm and so, if the 16th harmonic is similar, I would expect that the interference level should be less than -75dBm, but I am see about -60dBm.Have I just got a bad mixer with poor RF-IF isolation (only about 5dB!) or is there another explanation?ThanksMark

8214. Re: Raised noise floor when using DDS 3 at 10.7MHz as a signal source for SA - Poor RF-IF isolation in Mixer 1?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-21 14:49:02 UTC
From: Sam
Topic: 8212 Message: 8214

Another good reason to use a low pass filter.
Interestingly, issues with high frequency (>1 GHz) components of the TG (whether the true TG or DDS3) seem to arise mostly when working with frequencies in the 0-15 MHz range. This makes it quite easy to create a low pass filter that will zap the high frequencies and have minimal impact on the frequencies of interest. In fact, you could do it with a couple of ferrite beads, if you pick ones with the proper frequency range.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Mark,
> Â You have your formula almost correct:
> 16 * 64MHz - 10.7Mhz = 1013.3MHz - the 1st IF frequency
> it is really
> 16 * 64MHz - 10.7Mhz = 1013.3MHz, where 10.7 is the commanded DDS3
> This is an alias and very powerful at 1013.3 MHz. This is the configuration when sweeping the cavity filter when the MSA is fully constructed.
> Â More specifically the formula for the output of the DDS is:
> N * 64MHz +/- C, where N is any whole number, and C is the commanded DDS output.
> I think your levels are about right.
> Â Scotty
>
> --- On Mon, 6/20/11, Mark Burgin <mark@...> wrote:
>
> From: Mark Burgin <mark@...>
> Subject: [spectrumanalyzer] Raised noise floor when using DDS 3 at 10.7MHz as a signal source for SA - Poor RF-IF isolation in Mixer 1?
> To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
> Date: Monday, June 20, 2011, 6:01 PM
>
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>
> Hi EveryoneAs I mentioned in a previous posting, I have just built DDS 3 and am trying to use it to measure the performance of one of my resolution filters.Â Once the software bug was fixed Â (thanks Sam) everything more or less worked as expected but I noticed one peculiarity which I am unable to fully explain.If I connect DDS 3 output to the SA input, set DDS 3 to output 10.7MHz, and do a sweep of the SA (any frequency range), I see that the noise floor across the whole band has raised to approx -60dBm.Â If I disconnect the DD3 output from the SA input, the noise floor returns to less than -100dBm.Â Or if I tune DDS 3 to a different frequency, 10MHz for example, the noise floor lowers back to its normal place.Â It seems that the output from DDS 3 is leaking through to the log detector somehow when it is set to the IF frequency.Â Note that I have not built or connected Mixer 3, Â Mixer 4, PLO 3 or the Phase Detector - it is just the basic SA
> + DDS 3 used as the signal source.I think I understand why this is happening.Â The DDS output is rich in harmonics and one of them will be at 16 * 64MHz - 10.7Mhz = 1013.3MHz - the 1st IF frequency!Â If this leaks through Mixer 1, it will eventually appear as a 10.7Mhz signal at the Log Detector.Â I have confirmed this to some degree since, if I insert a 10.7MHz bandpass filter between DDS 3 output and the SA input eliminating the harmonics, the problem goes away.But what I don't understand is why the effect is so large.Â Looking at the data sheet for the ADE-11X, the RF-IF isolation at 1GHz is about 20db.Â By tuning DDS 3 slightly off 10.7MHz to avoid the noise floor issue, I have measured the amplitude of the (15*64MHz - 10.7MHz) and (14*64MHz - 10.7MHz) harmonics and both are around -55dBm and so, if the 16th harmonic is similar, I would expect that the interference level should be less than -75dBm, but I am see about -60dBm.Have I just got a
> bad mixer with poor RF-IF isolation (only about 5dB!) or is there another explanation?ThanksMark
>

8215. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-22 04:46:04 UTC
From: inlinebeginner
Topic: 8178 Message: 8215

Sam
The phase sitll has glitch, see the photo here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1301870247/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc

To simplify the problem, I went back to VNA TX mode and meausre a cable. Before VAN TX mode calibriation, the phase looks ok, but once I calibrate a 'through' I got phase glitch.
I did do a initial phase cal. The cal data is different from your example.

```
---------------------
*Filter Path 1: CenterFreq=10.111660 MHz; Bandwidth=1.000000 kHz
*Calibrated 06/21/11 at 2.000000 MHz.
CalVersion= 1.03
MagTable=
* ADC dBm Phase in increasing order of ADC
0 -120.000 2.19
4965 -110.000 2.19
4989 -107.500 2.19
5041 -105.000 2.19
5116 -102.500 2.19
5249 -100.000 2.19
5457 -97.500 2.19
5817 -95.000 2.19
6263 -92.500 2.19
6816 -90.000 2.19
7233 -88.401 2.19
8063 -85.000 2.50
9369 -80.000 3.04
12015 -70.000 3.03
14676 -60.000 3.07
17392 -50.000 2.93
20092 -40.000 2.74
22828 -30.000 1.71
25658 -20.000 0.00
28446 -10.000 -0.15
29106 -7.500 -0.15
29755 -5.000 -0.15
30336 -2.500 -0.15
30720 0.000 -0.15
```

Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> The colors of the lines are supposed to match the color of the scale in the way you

describe. I have not encountered a situation where they did not match. Did you perhaps change the Primary Axis settings? That is the only thing I can imagine that might switch the colors (though it shouldn't).
>
> If you place a marker, the marker readings will also indicate which curve goes with which axis. Or you can use the Data menu to display the graph data, which will show all the values for magnitude and phase, which will tell you which line is which. Finally, the Smith chart graph will be in the same color as the magnitude graph.
>
> I suspect that the blue curve is in fact magnitude, which means your readings are very far from what they should be. That's why I suspected an error in the OSL calibration procedure or in the hookup of the DC.
>
> You can't recreate the OSL info from what you saved. You will have to re-do the OSL calibration. There is a Save Debug Info item in the File menu that allows you to save and then reload enough info to recreate the state of the software, but it is intended for basic debugging, hasn't proven all that useful and has not been updated to include OSL info. If you want to save OSL info you can select OSL Info in the Data menu, and then save the displayed data, but there is no way to reload it.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > For the color, If you look at the curve and scale:
> > Scale Curve
> > Deg: Yellow Blue
> > Mag: Blue Yellow
> >
> > When the Deg and Mag has a similar curve, you will read the blue curve and try to find the blue scale, and give us a wrong number. If we can make the color match like this:
> >
> > Scale Curve
> > Deg: Blue Blue
> > Mag: Yellow Yellow
> >
> > It may be easier to read the curve.
> >
> > Thanks
> > Lin
> >
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > >
> > > Sam
> > > Thanks for the infor, I will try it soon. Before that I'd like to know how can I recall the OSL cal data from what I saved.
> > > Lin
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >

> > > > By not having done phase cal, do you mean you haven't calibrated the PDM inversion? That could definitely distort the measurement. I also note that your wait time is 0, which rarely gives good results in Reflection mode. Any glitch that occurs during the O, S or L calibrations will show up in every subsequent measurement, along with any glitch that arises in the measurement itself. Use Auto Wait or at least 20 ms wait time even for the wide video filter.
> > > >
> > > > The color of very thin lines on a sharply contrasting background is not accurate on some monitors, and also gets distorted in jpegs. For compression, it is better to use .png files, which are accurate and are also very compact when the picture contains broad areas of flat color. (.tif files are good too, but I don't think Yahoo lets you upload them.) When I do use jpegs, I have gotten best results by using a dark brown rather than black background (to reduce the contrast), and using double-width graph lines.
> > > >
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > >
> > > > > I think my calculation was wrong, the return loss should be -12dB for a 83 ohm resistor load.
> > > > > Lin
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > >
> > > > > > Sam
> > > > > > I put a photo here:
> > > > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1752124177/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > > >
> > > > > > 1) I did OSL cal, and meausred a 83 ohm resistor, the calculated S11 is -6dB, while measured -12dB. I use ZEDC-15-2B, Minicircuit DC.
> > > > > > 2) The curve has glitches, is that because I did not do a phase cal?
> > > > > > 3) The curve color looks like not matching the scale color.
> > > > > > Thanks
> > > > > > Lin
> > > > > >
> > > > >
> > > >
> > >
> >
>

8216. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-22 14:23:37 UTC
From: Sam
Topic: 8178 Message: 8216

Lin,
From your description, I gathered that you cabled the TG to the MSA input, did a Through calibration, and then did a scan with the same cable in place. But the overall slant in the phase graph indicates that there was a length change between the calibration and the scan.

I'm almost positive that the glitches are caused by an incorrect value for the PDM inversion. Did you follow the calibration procedure for determining that value? With an incorrect value, whenever the PDM is inverted, the phase value will be off by a fixed amount, which causes the phase graph to shift between two parallel paths. The shifts will occur both during calibration and during the cable scan, so you get more glitches than you might expect.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> The phase sitll has glitch, see the photo here:
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1301870247/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
>
> To simplify the problem, I went back to VNA TX mode and meausre a cable. Before VAN TX mode calibriation, the phase looks ok, but once I calibrate a 'through' I got phase glitch.
> I did do a initial phase cal. The cal data is different from your example.
>
> ----------
> *Filter Path 1: CenterFreq=10.111660 MHz; Bandwidth=1.000000 kHz
> *Calibrated 06/21/11 at 2.000000 MHz.
> CalVersion= 1.03
> MagTable=
> * ADC dBm Phase in increasing order of ADC
> 0 -120.000 2.19
> 4965 -110.000 2.19
> 4989 -107.500 2.19
> 5041 -105.000 2.19
> 5116 -102.500 2.19
> 5249 -100.000 2.19
> 5457 -97.500 2.19
> 5817 -95.000 2.19
> 6263 -92.500 2.19
> 6816 -90.000 2.19
> 7233 -88.401 2.19
> 8063 -85.000 2.50
> 9369 -80.000 3.04
> 12015 -70.000 3.03
> 14676 -60.000 3.07

```
> 17392 -50.000 2.93
> 20092 -40.000 2.74
> 22828 -30.000 1.71
> 25658 -20.000 0.00
> 28446 -10.000 -0.15
> 29106 -7.500 -0.15
> 29755 -5.000 -0.15
> 30336 -2.500 -0.15
> 30720 0.000 -0.15
>
> Thanks
> Lin
>
```

8217. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-23 01:12:26 UTC
From: inlinebeginner
Topic: 8178 Message: 8217

Sam
I just followed the steps your wrote in the inital calibration. Do you have another instruction to calibrate the phase detector?
Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Lin,
> From your description, I gathered that you cabled the TG to the MSA input, did a Through calibration, and then did a scan with the same cable in place. But the overall slant in the phase graph indicates that there was a length change between the calibration and the scan.
>
> I'm almost positive that the glitches are caused by an incorrect value for the PDM inversion. Did you follow the calibration procedure for determining that value? With an incorrect value, whenever the PDM is inverted, the phase value will be off by a fixed amount, which causes the phase graph to shift between two parallel paths. The shifts will occur both during calibration and during the cable scan, so you get more glitches than you might expect.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Sam
> > The phase sitll has glitch, see the photo here:
> > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1301870247/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> >
> > To simplify the problem, I went back to VNA TX mode and meausre a cable. Before VAN TX mode calibriation, the phase looks ok, but once I calibrate a 'through' I got phase glitch.
> > I did do a initial phase cal. The cal data is different from your example.
> >
> > ----------
> > *Filter Path 1: CenterFreq=10.111660 MHz; Bandwidth=1.000000 kHz
> > *Calibrated 06/21/11 at 2.000000 MHz.
> > CalVersion= 1.03
> > MagTable=
> > * ADC dBm Phase in increasing order of ADC
> > 0 -120.000 2.19
> > 4965 -110.000 2.19
> > 4989 -107.500 2.19
> > 5041 -105.000 2.19
> > 5116 -102.500 2.19
> > 5249 -100.000 2.19

```
> > 5457 -97.500 2.19
> > 5817 -95.000 2.19
> > 6263 -92.500 2.19
> > 6816 -90.000 2.19
> > 7233 -88.401 2.19
> > 8063 -85.000 2.50
> > 9369 -80.000 3.04
> > 12015 -70.000 3.03
> > 14676 -60.000 3.07
> > 17392 -50.000 2.93
> > 20092 -40.000 2.74
> > 22828 -30.000 1.71
> > 25658 -20.000 0.00
> > 28446 -10.000 -0.15
> > 29106 -7.500 -0.15
> > 29755 -5.000 -0.15
> > 30336 -2.500 -0.15
> > 30720 0.000 -0.15
> >
> > Thanks
> > Lin
> >
>
```

8218. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-23 01:18:30 UTC
From: inlinebeginner
Topic: 8178 Message: 8218

Sam
This is the doc that I followed during phase calibration:
http://f1.grp.yahoofs.com/v1/EJACTlx-Ri7yiEitTvBWmHSD_h6VykoUjU4NWfv0l0q6C0aKRUPrPfoBnn2pl6dRKzdU4G57p-2VZLMZ6vH0_jz0vu-yIXPhJQtyu8U/InitialCal.pdf
Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> I just followed the steps your wrote in the inital calibration. Do you have another instruction to calibrate the phase detector?
> Thanks
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Lin,
> > From your description, I gathered that you cabled the TG to the MSA input, did a Through calibration, and then did a scan with the same cable in place. But the overall slant in the phase graph indicates that there was a length change between the calibration and the scan.
> >
> > I'm almost positive that the glitches are caused by an incorrect value for the PDM inversion. Did you follow the calibration procedure for determining that value? With an incorrect value, whenever the PDM is inverted, the phase value will be off by a fixed amount, which causes the phase graph to shift between two parallel paths. The shifts will occur both during calibration and during the cable scan, so you get more glitches than you might expect.
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > >
> > > Sam
> > > The phase sitll has glitch, see the photo here:
> > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1301870247/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > >
> > > To simplify the problem, I went back to VNA TX mode and meausre a cable. Before VAN TX mode calibriation, the phase looks ok, but once I calibrate a 'through' I got phase glitch.
> > > I did do a initial phase cal. The cal data is different from your example.
> > >
> > > ----------

```
> > > *Filter Path 1: CenterFreq=10.111660 MHz; Bandwidth=1.000000 kHz
> > > *Calibrated 06/21/11 at 2.000000 MHz.
> > > CalVersion= 1.03
> > > MagTable=
> > > * ADC dBm Phase in increasing order of ADC
> > > 0 -120.000 2.19
> > > 4965 -110.000 2.19
> > > 4989 -107.500 2.19
> > > 5041 -105.000 2.19
> > > 5116 -102.500 2.19
> > > 5249 -100.000 2.19
> > > 5457 -97.500 2.19
> > > 5817 -95.000 2.19
> > > 6263 -92.500 2.19
> > > 6816 -90.000 2.19
> > > 7233 -88.401 2.19
> > > 8063 -85.000 2.50
> > > 9369 -80.000 3.04
> > > 12015 -70.000 3.03
> > > 14676 -60.000 3.07
> > > 17392 -50.000 2.93
> > > 20092 -40.000 2.74
> > > 22828 -30.000 1.71
> > > 25658 -20.000 0.00
> > > 28446 -10.000 -0.15
> > > 29106 -7.500 -0.15
> > > 29755 -5.000 -0.15
> > > 30336 -2.500 -0.15
> > > 30720 0.000 -0.15
> > >
> > > Thanks
> > > Lin
> > >
> >
>
```

8219. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-23 04:19:52 UTC
From: inlinebeginner
Topic: 8178 Message: 8219

Sam
I just found some information on Soctty's website, looks like I did not do a PDM calibration. I will try it.
Lin

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> This is the doc that I followed during phase calibration:
> http://f1.grp.yahoofs.com/v1/EJACTlx-Ri7yiEitTvBWmHSD_h6VykoUjU4NWfv0l0q6C0aKRUPrPfoBnn2pl6dRKzdU4G57p-2VZLMZ6vH0_jz0vu-yIXPhJQtyu8U/InitialCal.pdf
> Thanks
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Sam
> > I just followed the steps your wrote in the inital calibration. Do you have another instruction to calibrate the phase detector?
> > Thanks
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > Lin,
> > > From your description, I gathered that you cabled the TG to the MSA input, did a Through calibration, and then did a scan with the same cable in place. But the overall slant in the phase graph indicates that there was a length change between the calibration and the scan.
> > >
> > > I'm almost positive that the glitches are caused by an incorrect value for the PDM inversion. Did you follow the calibration procedure for determining that value? With an incorrect value, whenever the PDM is inverted, the phase value will be off by a fixed amount, which causes the phase graph to shift between two parallel paths. The shifts will occur both during calibration and during the cable scan, so you get more glitches than you might expect.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > >
> > > > Sam
> > > > The phase sitll has glitch, see the photo here:
> > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1301870247/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc

> > > >
> > > > To simplify the problem, I went back to VNA TX mode and meausre a cable. Before VAN TX mode calibriation, the phase looks ok, but once I calibrate a 'through' I got phase glitch.
> > > > I did do a initial phase cal. The cal data is different from your example.
> > > >
> > > > ----------
> > > > *Filter Path 1: CenterFreq=10.111660 MHz; Bandwidth=1.000000 kHz
> > > > *Calibrated 06/21/11 at 2.000000 MHz.
> > > > CalVersion= 1.03
> > > > MagTable=
> > > > * ADC dBm Phase in increasing order of ADC
> > > > 0 -120.000 2.19
> > > > 4965 -110.000 2.19
> > > > 4989 -107.500 2.19
> > > > 5041 -105.000 2.19
> > > > 5116 -102.500 2.19
> > > > 5249 -100.000 2.19
> > > > 5457 -97.500 2.19
> > > > 5817 -95.000 2.19
> > > > 6263 -92.500 2.19
> > > > 6816 -90.000 2.19
> > > > 7233 -88.401 2.19
> > > > 8063 -85.000 2.50
> > > > 9369 -80.000 3.04
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> > > > 20092 -40.000 2.74
> > > > 22828 -30.000 1.71
> > > > 25658 -20.000 0.00
> > > > 28446 -10.000 -0.15
> > > > 29106 -7.500 -0.15
> > > > 29755 -5.000 -0.15
> > > > 30336 -2.500 -0.15
> > > > 30720 0.000 -0.15
> > > >
> > > > Thanks
> > > > Lin
> > > >
> > >
> >
>

8220. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-23 16:29:48 UTC
From: Sam
Topic: 8178 Message: 8220

I suppose I should clarify in my "Initial Calibration" document that you must first calibrate the PDM inversion. This is a fairly automated procedure invoked through menu Setup->PDM Calibration, which opens a window that completely explains the procedure.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> I just found some information on Soctty's website, looks like I did not do a PDM calibration. I will try it.
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Sam
> > This is the doc that I followed during phase calibration:
> > http://f1.grp.yahoofs.com/v1/EJACTlx-Ri7yiEitTvBWmHSD_h6VykoUjU4NWfv0l0q6C0aKRUPrPfoBn n2pl6dRKzdU4G57p-2VZLMZ6vH0_jz0vu-yIXPhJQtyu8U/InitialCal.pdf
> > Thanks
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > >
> > > Sam
> > > I just followed the steps your wrote in the inital calibration. Do you have another instruction to calibrate the phase detector?
> > > Thanks
> > > Lin
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >
> > > > Lin,
> > > > From your description, I gathered that you cabled the TG to the MSA input, did a Through calibration, and then did a scan with the same cable in place. But the overall slant in the phase graph indicates that there was a length change between the calibration and the scan.
> > > >
> > > > I'm almost positive that the glitches are caused by an incorrect value for the PDM inversion. Did you follow the calibration procedure for determining that value? With an incorrect value, whenever the PDM is inverted, the phase value will be off by a fixed amount, which causes the phase graph to shift between two parallel paths. The shifts will occur both during calibration and during the cable scan, so you get more glitches than you might expect.
> > > >
> > > > Sam W.

> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > >
> > > > > Sam
> > > > > The phase sitll has glitch, see the photo here:
> > > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1301870247/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > >
> > > > > To simplify the problem, I went back to VNA TX mode and meausre a cable. Before VAN TX mode calibriation, the phase looks ok, but once I calibrate a 'through' I got phase glitch.
> > > > > I did do a initial phase cal. The cal data is different from your example.
> > > > >
> > > > > ----------
> > > > > *Filter Path 1: CenterFreq=10.111660 MHz; Bandwidth=1.000000 kHz
> > > > > *Calibrated 06/21/11 at 2.000000 MHz.
> > > > > CalVersion= 1.03
> > > > > MagTable=
> > > > > * ADC dBm Phase in increasing order of ADC
> > > > > 0 -120.000 2.19
> > > > > 4965 -110.000 2.19
> > > > > 4989 -107.500 2.19
> > > > > 5041 -105.000 2.19
> > > > > 5116 -102.500 2.19
> > > > > 5249 -100.000 2.19
> > > > > 5457 -97.500 2.19
> > > > > 5817 -95.000 2.19
> > > > > 6263 -92.500 2.19
> > > > > 6816 -90.000 2.19
> > > > > 7233 -88.401 2.19
> > > > > 8063 -85.000 2.50
> > > > > 9369 -80.000 3.04
> > > > > 12015 -70.000 3.03
> > > > > 14676 -60.000 3.07
> > > > > 17392 -50.000 2.93
> > > > > 20092 -40.000 2.74
> > > > > 22828 -30.000 1.71
> > > > > 25658 -20.000 0.00
> > > > > 28446 -10.000 -0.15
> > > > > 29106 -7.500 -0.15
> > > > > 29755 -5.000 -0.15
> > > > > 30336 -2.500 -0.15
> > > > > 30720 0.000 -0.15
> > > > >
> > > > > Thanks
> > > > > Lin
> > > > >
> > > > >
> > >
> >

>

8221. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-24 01:02:14 UTC
From: inlinebeginner
Topic: 8178 Message: 8221

Sam
If you can put a reminder in your doc, it could be better.
After I did the PDM calibration, it is ok now, I put three photos here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/957908904/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc

This is a 83 ohm resistor load, in reflection mode, I measured 12.2dB, the calculated value is 12.11dB.

The glithes are gone on the HPF and cable phase.

For the color problem, I found you setting is correct, but it does not disply correct, unless I doulbe click the scale open and close the pop windows.

Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I suppose I should clarify in my "Initial Calibration" document that you must first calibrate the PDM inversion. This is a fairly automated procedure invoked through menu Setup->PDM Calibration, which opens a window that completely explains the procedure.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Sam
> > I just found some information on Soctty's website, looks like I did not do a PDM calibration. I will try it.
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > >
> > > Sam
> > > This is the doc that I followed during phase calibration:
> > > http://f1.grp.yahoofs.com/v1/EJACTlx-Ri7yiEitTvBWmHSD_h6VykoUjU4NWfv0l0q6C0aKRUPrPfoBnn2pl6dRKzdU4G57p-2VZLMZ6vH0_jz0vu-yIXPhJQtyu8U/InitialCal.pdf
> > > Thanks
> > > Lin
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > >
> > > > Sam
> > > > I just followed the steps your wrote in the inital calibration. Do you have another instruction to calibrate the phase detector?
> > > > Thanks

> > > > Lin
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > >
> > > > > Lin,
> > > > > From your description, I gathered that you cabled the TG to the MSA input, did a Through calibration, and then did a scan with the same cable in place. But the overall slant in the phase graph indicates that there was a length change between the calibration and the scan.
> > > > >
> > > > > I'm almost positive that the glitches are caused by an incorrect value for the PDM inversion. Did you follow the calibration procedure for determining that value? With an incorrect value, whenever the PDM is inverted, the phase value will be off by a fixed amount, which causes the phase graph to shift between two parallel paths. The shifts will occur both during calibration and during the cable scan, so you get more glitches than you might expect.
> > > > >
> > > > > Sam W.
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > >
> > > > > > Sam
> > > > > > The phase sitll has glitch, see the photo here:
> > > > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1301870247/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > > >
> > > > > > To simplify the problem, I went back to VNA TX mode and meausre a cable. Before VAN TX mode calibriation, the phase looks ok, but once I calibrate a 'through' I got phase glitch.
> > > > > > I did do a initial phase cal. The cal data is different from your example.
> > > > > >
> > > > > > ----------
> > > > > > *Filter Path 1: CenterFreq=10.111660 MHz; Bandwidth=1.000000 kHz
> > > > > > *Calibrated 06/21/11 at 2.000000 MHz.
> > > > > > CalVersion= 1.03
> > > > > > MagTable=
> > > > > > * ADC dBm Phase in increasing order of ADC
> > > > > > 0 -120.000 2.19
> > > > > > 4965 -110.000 2.19
> > > > > > 4989 -107.500 2.19
> > > > > > 5041 -105.000 2.19
> > > > > > 5116 -102.500 2.19
> > > > > > 5249 -100.000 2.19
> > > > > > 5457 -97.500 2.19
> > > > > > 5817 -95.000 2.19
> > > > > > 6263 -92.500 2.19
> > > > > > 6816 -90.000 2.19
> > > > > > 7233 -88.401 2.19
> > > > > > 8063 -85.000 2.50

```
> > > > > > 9369 -80.000 3.04
> > > > > > 12015 -70.000 3.03
> > > > > > 14676 -60.000 3.07
> > > > > > 17392 -50.000 2.93
> > > > > > 20092 -40.000 2.74
> > > > > > 22828 -30.000 1.71
> > > > > > 25658 -20.000 0.00
> > > > > > 28446 -10.000 -0.15
> > > > > > 29106 -7.500 -0.15
> > > > > > 29755 -5.000 -0.15
> > > > > > 30336 -2.500 -0.15
> > > > > > 30720 0.000 -0.15
> > > > > >
> > > > > > Thanks
> > > > > > Lin
> > > > > >
> > > > > >
> > > > >
> > >
>
```

8222. Re: [spectrumanalyzer] Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-24 12:03:16 UTC
From: Jim Hontoria
Topic: 8171 Message: 8222

Hi Mark,

Thanks for the feedback. I had an issue with the log detector failing and took a few days to get a replacement.
The MSA is back in operation with the same noise/ oscillation problem. The point is that the PLO1 was working fine some time ago, albeit with the low frequency oscillation. However, that oscillation never masked the zero response hump.Simply, it doesn't show up at all. I haven't touched the PLO and Iam getting decent control signals. At the zero hump setting, all I get is a uniform, 40 dB amplitude, noise band.
A 0 to 1000 scan shows that band extending up to 240 MHz where it drops to a lower level noise band about 10dB in amplitude all the way to 1000 MHz.
The video filters do not have any effect whatsoever (but I have verify their operation).
The second noise band is caused somewhere after the IF ampilifier, whereas the under 240MHz band originates before it, mostl ikely at the PLO.
Jim W1JGH
On Sat, Jun 18, 2011 at 4:50 PM, Mark Burgin <mark@...> wrote:

> **
>
>
> HI Jim****
>
> I'm pretty certain that your problem is caused by too much gain in the PLO
> loop. As I said, for me it was caused by the bug in handling the 4112 but
> it seems that you have eliminated that as a possibility. When it happened
> to me, it was very similar to your problem. It was noisy up to about 190MHz
> and fine at higher frequencies. Look for messages on the groups dated
> around 2nd Dec. 2010 with title "Software changes needed to support the
> ADF4112/ADF4113 in PLO1 and PLO2" to see the discussions.****
>
> I suppose there are several other things that could cause the gain to be
> too high. Have you double checked the values of R23 (the curent setting
> resistor), R1, R2 and C1. Any of these being wrong could cause the issue.
> Are you using the recommended ROS-2150VW VCO?****
>
> Good luck****
>
> Mark****
>
> ** **
>
> *From:* spectrumanalyzer@yahoogroups.com [mailto:
> spectrumanalyzer@yahoogroups.com] *On Behalf Of *Jim Hontoria

> *Sent:* 18 June 2011 21:33
> *To:* spectrumanalyzer@yahoogroups.com
> *Subject:* Re: [spectrumanalyzer] Re: MSA oscillation****
>
> ** **
>
> ****
>
> Ok. So it is not the USB software, unless that section of the code anyway.
> ****
>
> The 0 -140 MHz noise/oscillation problem still remains. Any takers on this
> one?****
>
> ** **
>
> Jim W1JGH****
>
> ** **
>
> ** **
>
> On Sat, Jun 18, 2011 at 1:16 PM, Sam <swetterlin@...> wrote:****
>
> ****
>
> The dates of the two changes aren't exactly the same, but they were both
> incorporated into version 116 Rev. A before it was released.
>
> In the next version, the PLL listings will be clearer. There will be an
> entry for "2326,4118" and another for "4112,4113". (Internally, the software
> still codes these as simply 2326 and 4112.)
>
> For the present, you should be sure you have selected "4112".****
>
>
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...>
> wrote:
> >****
>
> > I understand and I see that there is a single branch of code, which is
> the
> > way to go. However, I see that Scotty's mods are dated December 2010
> whereas
> > the USB code sections appear to be written earlier in August (although
> they
> > may have been transcribed unchanged to the program at a later date).

> >
> > Jim W1JGH
> > ****
>
> > On Sat, Jun 18, 2011 at 12:02 PM, Sam <swetterlin@...> wrote:
> >
> > > **
> > >
> > >
> > > Dave's code was all transferred to my program file, so we don't have a
> USB
> > > branch and a non-USB branch. Scotty's change for the ADF4112 was made
> about
> > > the same time, and both were included in the original beta release of
> > > Version 116, Rev. A. So the ADF4112 changes are in all the beta
> releases
> > > through the most recent, which is Rev. D.
> > > Sam W.
> > >
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@>
> > > wrote:
> > > >
> > > > I believe now that this maybe strictly a USB issue. My understanding
> is
> > > that
> > > > Dave completed his coding around end August 2010, therefore, any
> changes
> > > > after that may have not been made their way to the USB code in
> Liberty
> > > > Basic.
> > > > Sam maybe able to shed some light onto this.
> > > >
> > > > Jim W1JGH
> > > >
> > > >
> > > > On Sat, Jun 18, 2011 at 11:29 AM, william sprowls <wsprowls@>wrote:
> > >
> > > >
> > > > > **
> > > > >
> > > > >
> > > > > Hi Jim,
> > > > > If you are using Version 115 (and) using it with Liberty Basic, you
> can
> > > > > just change the code. Go and find the following code:
> > > > >
> > > > > [Command4112R]'needed:
> > > > >
> > >

> rcounter,preselector,phasepolarity,control,Jcontrol,port,LEPLL,contclear ;
> > > > > commands AD4112 rcounter
> > > > > '[Create4112InitBuffer]'needed:preselector,phasepolarity
> > > > > N23=1 'N24,23 prescaler: 0=8, 1=16, 2=32, 3=64
> > > > > N22=0 'preselector defaulted to 32
> > > > > if preselector =8 then N23=0:N22=0
> > > > > if preselector =16 then N23=0:N22=1
> > > > > if preselector =64 then N23=1:N22=1
> > > > > N21=0 'Power Down Mode, 0=async, 1=sync use 0
> > > > > N20=1 'N22,21,20 Phase Current for Set 2
> > > > > N19=1 'current= min current + min current*bit value
> > > > > N18=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
> > > > > N17=1 'N18,17,16 Phase Current for Set 1
> > > > > N16=1 'current= min current + min current*bit value
> > > > > N15=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
> > > > >
> > > > > in the above code, change N15 thru N20 to the following:
> > > > > N20=0 'N20,19,18 Phase Current for Set 2 '12-3-10
> > > > > N19=0 'current= min current + min current*bit value '12-3-10
> > > > > N18=1 'use bit value of 1 and 4.7 Kohm for 1.25 ma '12-3-10
> > > > > N17=0 'N17,16,15 Phase Current for Set 1 '12-3-10
> > > > > N16=0 'current= min current + min current*bit value '12-3-10
> > > > > N15=1 'use bit value of 1 and 4.7 Kohm for 1.25 ma '12-3-10
> > > > >
> > > > > What this does is change the PLL charge pump current from 5 ma to
> 1.25
> > > ma.
> > > > > In very early MSA designs, the 5 ma worked very well using the
> National
> > > Semi
> > > > > PLL chip, LMX2325. I was never able to test using the ADF4112
> series. I
> > > just
> > > > > "assumed" it would be ok. Guess not!!!!!
> > > > > Scotty
> > > > > --- On *Sat, 6/18/11, Jim Hontoria <jghalpha@>* wrote:
> > > > >
> > > > >
> > > > > From: Jim Hontoria <jghalpha@>
> > >
> > > > > Subject: Re: [spectrumanalyzer] MSA oscillation
> > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > Date: Saturday, June 18, 2011, 9:46 AM
> > > > >
> > > > >
> > > > >
> > > > > Hi Mark,
> > > > >
> > > > > Yes I have the 4112s (with the famous extra resistor in place). I
> also

> > > have
> > > > > the latest software so I don't think that the bug fix made it to
> this
> > > one.
> > > > > After you mentioned it, I seem to recall now reading something
> about
> > > all
> > > > > this so I'm going to check the yahoo site mail and see if I find
> > > something.
> > > > > Any info you may have is greatly appreciated.
> > > > >
> > > > > Jim W1JGH
> > > > >
> > > > > On Sat, Jun 18, 2011 at 10:13 AM, Mark Burgin <mark@<
> > > http://mc/compose?to=mark@>
> > >
> > > > > > wrote:
> > > > >
> > > > > **
> > > > >
> > > > >
> > > > > Hi Jim****
> > > > >
> > > > > ** **
> > > > >
> > > > > I had exactly the same problem. I bet you are using the adf4112 or
> > > adf4113
> > > > > chip rather than the LMX2326. The adf411X chips seem to default to
> a
> > > higher
> > > > > output current than the LMX 2326 which increases the loop gain
> causing
> > > > > instability. There was a bug in earlier versions of the software
> that
> > > did
> > > > > not take account of this but I believe that current versions are OK
> so
> > > long
> > > > > as you have the ADF4112 set in the configuration settings.****
> > > > >
> > > > > ** **
> > > > >
> > > > > If you need more information or help let me know and I will tell
> you
> > > what
> > > > > to check.****
> > > > >
> > > > > ** **
> > > > >
> > > > > ** **

> > > > >
> > > > > Mark****
> > > > >
> > > > > ** **
> > > > >
> > > > > *From:* spectrumanalyzer@yahoogroups.com<
> > > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>[mailto:
> > > > > spectrumanalyzer@yahoogroups.com<
> > > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>]
> > >
> > > > > *On Behalf Of *jghbeta
> > > > > *Sent:* 18 June 2011 14:39
> > > > > *To:* spectrumanalyzer@yahoogroups.com<
> > > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>
> > >
> > > > > *Subject:* [spectrumanalyzer] MSA oscillation****
> > > > >
> > > > > ** **
> > > > >
> > > > > ****
> > > > >
> > > > >
> > > > > I have someform of oscillation/ high noise that extends from 0 to
> about
> > > 140
> > > > > MHz. No signal gets thru even the zero hump disappears. beyond
> that,
> > > there
> > > > > is no noise and I getbnice, sharp clear signals. I just have the
> MSA
> > > > > running. Any ideas?
> > > > >
> > > > > This site has become so quiet lately...
> > > > >
> > > > > Jim W1JGH****
> > > > >
> > > > > ****
> > > > >
> > > > >
> > > > >
> > > > >
> > > > > --
> > > > > Jim G. Hontoria
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> > > > Jim G. Hontoria
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> > Jim G. Hontoria
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> Jim G. Hontoria****
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Jim G. Hontoria

8223. Re: [spectrumanalyzer] Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-24 13:44:30 UTC
From: william sprowls
Topic: 8171 Message: 8223

Hi Jim,
 You first posted your problem a long time ago and it initiated a trouble shooting procedure. This resulted in changing the ADF4112 current from 5 ma to 1.25 ma. Because you had not posted the problem after the software change (until recently), I "assumed" that cured your problem. Don't you just love that word?
 I suggest this: All of your software should be in a single folder, probably called "MSA_Software". Zip the entire folder and attach it to an email to me. (wsprowls@...). I will look to see if anything is obvious.
Scotty

--- On Fri, 6/24/11, Jim Hontoria <jghalpha@...> wrote:

From: Jim Hontoria <jghalpha@...>
Subject: Re: [spectrumanalyzer] Re: MSA oscillation
To: spectrumanalyzer@yahoogroups.com
Date: Friday, June 24, 2011, 7:03 AM

Hi Mark, Thanks for the feedback. I had an issue with the log detector failing and took a few days to get a replacement. The MSA is back in operation with the same noise/ oscillation problem. The point is that the PLO1 was working fine some time ago, albeit with the low frequency oscillation. However, that oscillation never masked the zero response hump.Simply, it doesn't show up at all. I haven't touched the PLO and Iam getting decent control signals. At the zero hump setting, all I get is a uniform, 40 dB amplitude, noise band.
A 0 to 1000 scan shows that band extending up to 240 MHz where it drops to a lower level noise band about 10dB in amplitude all the way to 1000 MHz. The video filters do not have any effect whatsoever (but I have verify their operation).
The second noise band is caused somewhere after the IF ampilifier, whereas the under 240MHz band originates before it, mostl ikely at the PLO.Jim W1JGH
On Sat, Jun 18, 2011 at 4:50 PM, Mark Burgin <mark@...> wrote:

HI JimI'm pretty certain that your problem is caused by too much gain in the PLO loop. As I said, for me it was caused by the bug in handling the 4112 but it seems that you have eliminated that as a possibility. When it happened to me, it was very similar to your problem. It was noisy up to about 190MHz and fine at higher frequencies. Look for messages on the groups dated around 2nd Dec. 2010 with title "Software changes needed to support the ADF4112/ADF4113 in PLO1 and PLO2" to see the discussions.
I suppose there are several other things that could cause the gain to be too high. Have you double checked the values of R23 (the curent setting resistor), R1, R2 and C1. Any of these being wrong could cause the issue. Are you using the recommended ROS-2150VW VCO?
Good luckMark
 From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of Jim Hontoria

Sent: 18 June 2011 21:33
To: spectrumanalyzer@yahoogroups.com

Subject: Re: [spectrumanalyzer] Re: MSA oscillation
Ok. So it is not the USB software, unless that section of the code anyway.
The 0 -140 MHz noise/oscillation problem still remains. Any takers on this one? Jim W1JGH
On Sat, Jun 18, 2011 at 1:16 PM, Sam <swetterlin@...> wrote:
The dates of the two changes aren't exactly the same, but they were both incorporated into version 116 Rev. A before it was released.

In the next version, the PLL listings will be clearer. There will be an entry for "2326,4118" and another for "4112,4113". (Internally, the software still codes these as simply 2326 and 4112.)

For the present, you should be sure you have selected "4112".

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:

>> I understand and I see that there is a single branch of code, which is the
> way to go. However, I see that Scotty's mods are dated December 2010 whereas

> the USB code sections appear to be written earlier in August (although they
> may have been transcribed unchanged to the program at a later date).
>
> Jim W1JGH
>
> On Sat, Jun 18, 2011 at 12:02 PM, Sam <swetterlin@...> wrote:
>
> > **
> >
> >
> > Dave's code was all transferred to my program file, so we don't have a USB

> > branch and a non-USB branch. Scotty's change for the ADF4112 was made about
> > the same time, and both were included in the original beta release of
> > Version 116, Rev. A. So the ADF4112 changes are in all the beta releases

> > through the most recent, which is Rev. D.
> > Sam W.
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@>

> > wrote:
> > >
> > > I believe now that this maybe strictly a USB issue. My understanding is
> > that
> > > Dave completed his coding around end August 2010, therefore, any changes

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> > > Sam maybe able to shed some light onto this.
> > >
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> > >
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> > > On Sat, Jun 18, 2011 at 11:29 AM, william sprowls <wsprowls@>wrote:
> >
> > >
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> > > > Hi Jim,
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> > > > just change the code. Go and find the following code:
> > > >

> > > > [Command4112R]'needed:
> > > >
> > rcounter,preselector,phasepolarity,control,Jcontrol,port,LEPLL,contclear ;
> > > > commands AD4112 rcounter
> > > > '[Create4112InitBuffer]'needed:preselector,phasepolarity

> > > > N23=1 'N24,23 prescaler: 0=8, 1=16, 2=32, 3=64
> > > > N22=0 'preselector defaulted to 32
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> > > > N18=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
> > > > N17=1 'N18,17,16 Phase Current for Set 1
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> > > > in the above code, change N15 thru N20 to the following:
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> > > > N17=0 'N17,16,15 Phase Current for Set 1 '12-3-10

> > > > N16=0 'current= min current + min current*bit value '12-3-10
> > > > N15=1 'use bit value of 1 and 4.7 Kohm for 1.25 ma '12-3-10
> > > >
> > > > What this does is change the PLL charge pump current from 5 ma to 1.25

> > ma.
> > > > In very early MSA designs, the 5 ma worked very well using the National
> > Semi
> > > > PLL chip, LMX2325. I was never able to test using the ADF4112 series. I

> > just
> > > > "assumed" it would be ok. Guess not!!!!!
> > > > Scotty
> > > > --- On *Sat, 6/18/11, Jim Hontoria <jghalpha@>* wrote:
> > > >

> > > >
> > > > From: Jim Hontoria <jghalpha@>
> >
> > > > Subject: Re: [spectrumanalyzer] MSA oscillation
> > > > To: spectrumanalyzer@yahoogroups.com

> > > > Date: Saturday, June 18, 2011, 9:46 AM
> > > >
> > > >
> > > >
> > > > Hi Mark,
> > > >
> > > > Yes I have the 4112s (with the famous extra resistor in place). I also

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> > > > the latest software so I don't think that the bug fix made it to this
> > one.
> > > > After you mentioned it, I seem to recall now reading something about

> > all
> > > > this so I'm going to check the yahoo site mail and see if I find
> > something.
> > > > Any info you may have is greatly appreciated.
> > > >

> > > > Jim W1JGH
> > > >
> > > > On Sat, Jun 18, 2011 at 10:13 AM, Mark Burgin <mark@<
> > http://mc/compose?to=mark@>

> >
> > > > > wrote:
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> > > >
> > > >
> > > > Hi Jim****
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> > > >
> > > > I had exactly the same problem. I bet you are using the adf4112 or
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> > > > chip rather than the LMX2326. The adf411X chips seem to default to a

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> > > > output current than the LMX 2326 which increases the loop gain causing

> > > > instability. There was a bug in earlier versions of the software that
> > did

> > > > not take account of this but I believe that current versions are OK so
> > long
> > > > as you have the ADF4112 set in the configuration settings.****
> > > >

> > > > ** **
> > > >
> > > > If you need more information or help let me know and I will tell you
> > what
> > > > to check.****
> > > >

> > > > ** **
> > > >
> > > > ** **
> > > >
> > > > Mark****
> > > >
> > > > ** **
> > > >
> > > > *From:* spectrumanalyzer@yahoogroups.com<

> > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>[mailto:
> > > > spectrumanalyzer@yahoogroups.com<

> > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>]
> >
> > > > *On Behalf Of *jghbeta
> > > > *Sent:* 18 June 2011 14:39

> > > > *To:* spectrumanalyzer@...m<
> > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>

> >
> > > > *Subject:* [spectrumanalyzer] MSA oscillation****
> > > >
> > > > ** **
> > > >
> > > > ****
> > > >
> > > >

> > > > I have someform of oscillation/ high noise that extends from 0 to about
> > 140
> > > > MHz. No signal gets thru even the zero hump disappears. beyond that,
> > there

> > > > is no noise and I getbnice, sharp clear signals. I just have the MSA
> > > > running. Any ideas?

> > > >
> > > > This site has become so quiet lately...

> > > >
> > > > Jim W1JGH****
> > > >
> > > > ****
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> > > > Jim G. Hontoria
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> > > Jim G. Hontoria
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Jim G. Hontoria

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Jim G. Hontoria

8224. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-24 13:45:53 UTC
From: Sam
Topic: 8178 Message: 8224

Regarding the color. Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct? That would be very odd.

Your graph looks good, but I noticed that the phase graph starts negative and steadily gets more negative. This means that on the Smith chart the graph would be a small arc rather than a single point. I'll take a shot in the dark and guess that you calibrated with commercial standards that have the open and short implemented at the front of the connector (i.e. the calibration plane is at the front), whereas you have the 83 ohm resistor mounted on the back of a connector. That means your true DUT is the resistor at the end of a short transmission line. That transmission line (the connector) creates the non-zero phase. If my guess is correct, you can eliminate the delay by adjusting Plane Extension to move the reference plane from the front to the back of the connector.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> If you can put a reminder in your doc, it could be better.
> After I did the PDM calibration, it is ok now, I put three photos here:
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/957908904/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
>
> This is a 83 ohm resistor load, in reflection mode, I measured 12.2dB, the calculated value is 12.11dB.
>
> The glithes are gone on the HPF and cable phase.
>
> For the color problem, I found you setting is correct, but it does not disply correct, unless I doulbe click the scale open and close the pop windows.
>
> Thanks
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > I suppose I should clarify in my "Initial Calibration" document that you must first calibrate the PDM inversion. This is a fairly automated procedure invoked through menu Setup->PDM Calibration, which opens a window that completely explains the procedure.
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > >
> > > Sam
> > > I just found some information on Soctty's website, looks like I did not do a PDM

calibration. I will try it.
> > > Lin
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > >
> > > > Sam
> > > > This is the doc that I followed during phase calibration:
> > > > http://f1.grp.yahoofs.com/v1/EJACTlx-Ri7yiEitTvBWmHSD_h6VykoUjU4NWfv0l0q6C0aKRUPrPfoBnn2pl6dRKzdU4G57p-2VZLMZ6vH0_jz0vu-yIXPhJQtyu8U/InitialCal.pdf
> > > > Thanks
> > > > Lin
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > >
> > > > > Sam
> > > > > I just followed the steps your wrote in the inital calibration. Do you have another instruction to calibrate the phase detector?
> > > > > Thanks
> > > > > Lin
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > >
> > > > > > Lin,
> > > > > > From your description, I gathered that you cabled the TG to the MSA input, did a Through calibration, and then did a scan with the same cable in place. But the overall slant in the phase graph indicates that there was a length change between the calibration and the scan.
> > > > > >
> > > > > > I'm almost positive that the glitches are caused by an incorrect value for the PDM inversion. Did you follow the calibration procedure for determining that value? With an incorrect value, whenever the PDM is inverted, the phase value will be off by a fixed amount, which causes the phase graph to shift between two parallel paths. The shifts will occur both during calibration and during the cable scan, so you get more glitches than you might expect.
> > > > > >
> > > > > > Sam W.
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > >
> > > > > > > Sam
> > > > > > > The phase sitll has glitch, see the photo here:
> > > > > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1301870247/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > > > >
> > > > > > > To simplify the problem, I went back to VNA TX mode and meausre a cable. Before VAN TX mode calibriation, the phase looks ok, but once I calibrate a 'through' I got phase glitch.
> > > > > > > I did do a initial phase cal. The cal data is different from your example.
> > > > > > >
> > > > > > > ----------

> > > > > > > *Filter Path 1: CenterFreq=10.111660 MHz; Bandwidth=1.000000 kHz
> > > > > > > *Calibrated 06/21/11 at 2.000000 MHz.
> > > > > > > CalVersion= 1.03
> > > > > > > MagTable=
> > > > > > > * ADC dBm Phase in increasing order of ADC
> > > > > > > 0 -120.000 2.19
> > > > > > > 4965 -110.000 2.19
> > > > > > > 4989 -107.500 2.19
> > > > > > > 5041 -105.000 2.19
> > > > > > > 5116 -102.500 2.19
> > > > > > > 5249 -100.000 2.19
> > > > > > > 5457 -97.500 2.19
> > > > > > > 5817 -95.000 2.19
> > > > > > > 6263 -92.500 2.19
> > > > > > > 6816 -90.000 2.19
> > > > > > > 7233 -88.401 2.19
> > > > > > > 8063 -85.000 2.50
> > > > > > > 9369 -80.000 3.04
> > > > > > > 12015 -70.000 3.03
> > > > > > > 14676 -60.000 3.07
> > > > > > > 17392 -50.000 2.93
> > > > > > > 20092 -40.000 2.74
> > > > > > > 22828 -30.000 1.71
> > > > > > > 25658 -20.000 0.00
> > > > > > > 28446 -10.000 -0.15
> > > > > > > 29106 -7.500 -0.15
> > > > > > > 29755 -5.000 -0.15
> > > > > > > 30336 -2.500 -0.15
> > > > > > > 30720 0.000 -0.15
> > > > > > >
> > > > > > > Thanks
> > > > > > > Lin
> > > > > > >
> > > > > >
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> > > >
> >
>

8225. Re: [spectrumanalyzer] Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-24 14:00:12 UTC
From: Jim Hontoria
Topic: 8171 Message: 8225

Some progress: The oscillation band going all the way to 1000 MHz is caused by overloading of the dataclk. Disconecting DDS 3 and PLO3 eliminated that effect. I will deal with that later by installing a buffer.

I injected a 300 MHz signal and I got:
-An oscillation up to 240MHz about 15-20 dB in amplitude.
-At 240 MHz the oscillation disappears and the base line drops 30 dB and stays at that level all the way to 1000MHz with very little noise.
- Nice clean and strong signals at 300 and 600 and 900 harmonics.
Removed the 300 signal, and terminated the MSA input with 50 ohm. Checked the zero response: it continues being masked by the noise. No indication whatsoever.

Jim W1JGH

On Fri, Jun 24, 2011 at 8:03 AM, Jim Hontoria <jghalpha@...> wrote:

> Hi Mark,
>
> Thanks for the feedback. I had an issue with the log detector failing and
> took a few days to get a replacement.
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> Jim W1JGH
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>>
>> Good luck****
>>
>> Mark****
>>
>> ** **
>>
>> *From:* spectrumanalyzer@yahoogroups.com [mailto:
>> spectrumanalyzer@yahoogroups.com] *On Behalf Of *Jim Hontoria
>> *Sent:* 18 June 2011 21:33
>> *To:* spectrumanalyzer@yahoogroups.com
>> *Subject:* Re: [spectrumanalyzer] Re: MSA oscillation****
>>
>> ** **
>>
>> ****
>>
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>> rcounter,preselector,phasepolarity,control,Jcontrol,port,LEPLL,contclear ;
>> > > > > commands AD4112 rcounter
>> > > > > '[Create4112InitBuffer]'needed:preselector,phasepolarity
>> > > > > N23=1 'N24,23 prescaler: 0=8, 1=16, 2=32, 3=64
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>> > > > > From: Jim Hontoria <jghalpha@>
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>> > > > > Subject: Re: [spectrumanalyzer] MSA oscillation
>> > > > > To: spectrumanalyzer@yahoogroups.com
>> > > > > Date: Saturday, June 18, 2011, 9:46 AM
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>> > > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>]
>> > >
>> > > > > *On Behalf Of *jghbeta
>> > > > > *Sent:* 18 June 2011 14:39
>> > > > > *To:* spectrumanalyzer@yahoogroups.com<
>> > > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>
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8226. Re: [spectrumanalyzer] Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-24 14:10:52 UTC
From: Jim Hontoria
Topic: 8171 Message: 8226

I will also include the graph I am getiing with the drop at 128 MHz. You will note that the oscillation seems to increase up to that frequency and then it suddenly dies off..

Jim W1JGH

On Fri, Jun 24, 2011 at 9:44 AM, william sprowls <wsprowls@...> wrote:

> **
>
>
> Hi Jim,
> You first posted your problem a long time ago and it initiated a trouble
> shooting procedure. This resulted in changing the ADF4112 current from 5 ma
> to 1.25 ma. Because you had not posted the problem after the software change
> (until recently), I "assumed" that cured your problem. Don't you just love
> that word?
> I suggest this: All of your software should be in a single folder,
> probably called "MSA_Software". Zip the entire folder and attach it to an
> email to me. (wsprowls@...). I will look to see if anything is
> obvious.
> Scotty
>
> --- On *Fri, 6/24/11, Jim Hontoria <jghalpha@gmail.com>* wrote:
>
>
> From: Jim Hontoria <jghalpha@...>
>
> Subject: Re: [spectrumanalyzer] Re: MSA oscillation
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, June 24, 2011, 7:03 AM
>
>
>
>
> Hi Mark,
>
> Thanks for the feedback. I had an issue with the log detector failing and
> took a few days to get a replacement.
> The MSA is back in operation with the same noise/ oscillation problem. The
> point is that the PLO1 was working fine some time ago, albeit with the low
> frequency oscillation. However, that oscillation never masked the zero
> response hump.Simply, it doesn't show up at all. I haven't touched the PLO
> and Iam getting decent control signals. At the zero hump setting, all I get
> is a uniform, 40 dB amplitude, noise band.
> A 0 to 1000 scan shows that band extending up to 240 MHz where it drops to

> a lower level noise band about 10dB in amplitude all the way to 1000 MHz.
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> Are you using the recommended ROS-2150VW VCO?****
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> Good luck****
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> On Sat, Jun 18, 2011 at 1:16 PM, Sam
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> wrote:****
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> <
> > > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>[mailto:
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Jim G. Hontoria

8227. RE: [spectrumanalyzer] Re: MSA oscillation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-24 14:46:32 UTC
From: Mark Burgin
Topic: 8171 Message: 8227

Hi Scotty

I believe it was me who had the problem that resulted in the software change from 5ma to 1.25ma and not Jim. The software change fixed my problem as, I believe, I reported at the time. Jim's problem is more recent, and, it seems, not related to the same software issue.

Mark

From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of william sprowls
Sent: 24 June 2011 14:45
To: spectrumanalyzer@yahoogroups.com
Subject: Re: [spectrumanalyzer] Re: MSA oscillation

Hi Jim,
You first posted your problem a long time ago and it initiated a trouble shooting procedure. This resulted in changing the ADF4112 current from 5 ma to 1.25 ma. Because you had not posted the problem after the software change (until recently), I "assumed" that cured your problem. Don't you just love that word?
I suggest this: All of your software should be in a single folder, probably called "MSA_Software". Zip the entire folder and attach it to an email to me. (wsprowls@yahoo.com). I will look to see if anything is obvious.
Scotty

--- On Fri, 6/24/11, Jim Hontoria <jghalpha@gmail.com> wrote:

From: Jim Hontoria <jghalpha@gmail.com>
Subject: Re: [spectrumanalyzer] Re: MSA oscillation
To: spectrumanalyzer@yahoogroups.com
Date: Friday, June 24, 2011, 7:03 AM

Hi Mark,

Thanks for the feedback. I had an issue with the log detector failing and took a few days to get a replacement.
The MSA is back in operation with the same noise/ oscillation problem. The point is that the PLO1 was working fine some time ago, albeit with the low frequency oscillation. However, that oscillation never masked the zero response hump.Simply, it doesn't show up at all. I haven't touched the PLO and Iam getting decent control signals. At the zero hump setting, all I get is a uniform, 40 dB amplitude, noise band.
A 0 to 1000 scan shows that band extending up to 240 MHz where it drops to a lower level noise band about 10dB in amplitude all the way to 1000 MHz. The video filters do not have any effect whatsoever (but I have verify their operation).
The second noise band is caused somewhere after the IF ampilifier, whereas the under 240MHz band originates before it, mostl ikely at the PLO.
Jim W1JGH
On Sat, Jun 18, 2011 at 4:50 PM, Mark Burgin

<mark@mburgin.co.uk</mc/compose?to=mark@mburgin.co.uk>> wrote:

HI Jim

I'm pretty certain that your problem is caused by too much gain in the PLO loop. As I said, for me it was caused by the bug in handling the 4112 but it seems that you have eliminated that as a possibility. When it happened to me, it was very similar to your problem. It was noisy up to about 190MHz and fine at higher frequencies. Look for messages on the groups dated around 2nd Dec. 2010 with title "Software changes needed to support the ADF4112/ADF4113 in PLO1 and PLO2" to see the discussions.

I suppose there are several other things that could cause the gain to be too high. Have you double checked the values of R23 (the curent setting resistor), R1, R2 and C1. Any of these being wrong could cause the issue. Are you using the recommended ROS-2150VW VCO?

Good luck

Mark

From: spectrumanalyzer@yahoogroups.com</mc/compose?to=spectrumanalyzer@yahoogroups.com>
[mailto:spectrumanalyzer@yahoogroups.com</mc/compose?to=spectrumanalyzer@yahoogroups.com>]
On Behalf Of Jim Hontoria
Sent: 18 June 2011 21:33
To: spectrumanalyzer@yahoogroups.com</mc/compose?to=spectrumanalyzer@yahoogroups.com>
Subject: Re: [spectrumanalyzer] Re: MSA oscillation

Ok. So it is not the USB software, unless that section of the code anyway.

The 0 -140 MHz noise/oscillation problem still remains. Any takers on this one?

Jim W1JGH

On Sat, Jun 18, 2011 at 1:16 PM, Sam
<swetterlin@comcast.net</mc/compose?to=swetterlin@comcast.net>> wrote:

The dates of the two changes aren't exactly the same, but they were both incorporated into version 116 Rev. A before it was released.

In the next version, the PLL listings will be clearer. There will be an entry for "2326,4118" and another for "4112,4113". (Internally, the software still codes these as simply 2326 and 4112.)

For the present, you should be sure you have selected "4112".

Sam W.

--- In
spectrumanalyzer@yahoogroups.com</mc/compose?to=spectrumanalyzer%40yahoogroups.com>, Jim
Hontoria <jghalpha@...> wrote:
>

> I understand and I see that there is a single branch of code, which is the
> way to go. However, I see that Scotty's mods are dated December 2010 whereas
> the USB code sections appear to be written earlier in August (although they
> may have been transcribed unchanged to the program at a later date).

>
> Jim W1JGH
>

> On Sat, Jun 18, 2011 at 12:02 PM, Sam <swetterlin@...> wrote:
>
> > **
> >
> >
> > Dave's code was all transferred to my program file, so we don't have a USB
> > branch and a non-USB branch. Scotty's change for the ADF4112 was made about
> > the same time, and both were included in the original beta release of
> > Version 116, Rev. A. So the ADF4112 changes are in all the beta releases
> > through the most recent, which is Rev. D.
> > Sam W.
> >
> >
> > --- In
spectrumanalyzer@yahoogroups.com</mc/compose?to=spectrumanalyzer%40yahoogroups.com>, Jim
Hontoria <jghalpha@>
> > wrote:
> > >
> > > I believe now that this maybe strictly a USB issue. My understanding is
> > that
> > > Dave completed his coding around end August 2010, therefore, any changes
> > > after that may have not been made their way to the USB code in Liberty
> > > Basic.
> > > Sam maybe able to shed some light onto this.
> > >
> > > Jim W1JGH
> > >
> > >
> > > On Sat, Jun 18, 2011 at 11:29 AM, william sprowls <wsprowls@>wrote:
> >
> > >
> > > > **
> > > >
> > > >
> > > > Hi Jim,
> > > > If you are using Version 115 (and) using it with Liberty Basic, you can
> > > > just change the code. Go and find the following code:
> > > >
> > > > [Command4112R]'needed:
> > > >
> > rcounter,preselector,phasepolarity,control,Jcontrol,port,LEPLL,contclear ;
> > > > commands AD4112 rcounter
> > > > '[Create4112InitBuffer]'needed:preselector,phasepolarity
> > > > N23=1 'N24,23 prescaler: 0=8, 1=16, 2=32, 3=64
> > > > N22=0 'preselector defaulted to 32
> > > > if preselector =8 then N23=0:N22=0

> > > > if preselector =16 then N23=0:N22=1
> > > > if preselector =64 then N23=1:N22=1
> > > > N21=0 'Power Down Mode, 0=async, 1=sync use 0
> > > > N20=1 'N22,21,20 Phase Current for Set 2
> > > > N19=1 'current= min current + min current*bit value
> > > > N18=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
> > > > N17=1 'N18,17,16 Phase Current for Set 1
> > > > N16=1 'current= min current + min current*bit value
> > > > N15=1 'use bit value of 7 and 4.7 Kohm for 5.0 ma
> > > >
> > > > in the above code, change N15 thru N20 to the following:
> > > > N20=0 'N20,19,18 Phase Current for Set 2 '12-3-10
> > > > N19=0 'current= min current + min current*bit value '12-3-10
> > > > N18=1 'use bit value of 1 and 4.7 Kohm for 1.25 ma '12-3-10
> > > > N17=0 'N17,16,15 Phase Current for Set 1 '12-3-10
> > > > N16=0 'current= min current + min current*bit value '12-3-10
> > > > N15=1 'use bit value of 1 and 4.7 Kohm for 1.25 ma '12-3-10
> > > >
> > > > What this does is change the PLL charge pump current from 5 ma to 1.25
> > ma.
> > > > In very early MSA designs, the 5 ma worked very well using the National
> > Semi
> > > > PLL chip, LMX2325. I was never able to test using the ADF4112 series. I
> > just
> > > > "assumed" it would be ok. Guess not!!!!!
> > > > Scotty
> > > > --- On *Sat, 6/18/11, Jim Hontoria <jghalpha@>* wrote:
> > > >
> > > >
> > > > From: Jim Hontoria <jghalpha@>
> >
> > > > Subject: Re: [spectrumanalyzer] MSA oscillation
> > > > To:
spectrumanalyzer@yahoogroups.com</mc/compose?to=spectrumanalyzer%40yahoogroups.com>
> > > > Date: Saturday, June 18, 2011, 9:46 AM
> > > >
> > > >
> > > >
> > > > Hi Mark,
> > > >
> > > > Yes I have the 4112s (with the famous extra resistor in place). I also
> > have
> > > > the latest software so I don't think that the bug fix made it to this
> > one.
> > > > After you mentioned it, I seem to recall now reading something about
> > all
> > > > this so I'm going to check the yahoo site mail and see if I find
> > something.
> > > > Any info you may have is greatly appreciated.
> > > >

> > > > Jim W1JGH
> > > >
> > > > On Sat, Jun 18, 2011 at 10:13 AM, Mark Burgin <mark@<
> > http://mc/compose?to=mark@>
> >
> > > > > wrote:
> > > >
> > > > **
> > > >
> > > >
> > > > Hi Jim****
> > > >
> > > > ** **
> > > >
> > > > I had exactly the same problem. I bet you are using the adf4112 or
> > adf4113
> > > > chip rather than the LMX2326. The adf411X chips seem to default to a
> > higher
> > > > output current than the LMX 2326 which increases the loop gain causing
> > > > instability. There was a bug in earlier versions of the software that
> > did
> > > > not take account of this but I believe that current versions are OK so
> > long
> > > > as you have the ADF4112 set in the configuration settings.****
> > > >
> > > > ** **
> > > >
> > > > If you need more information or help let me know and I will tell you
> > what
> > > > to check.****
> > > >
> > > > ** **
> > > >
> > > > ** **
> > > >
> > > > Mark****
> > > >
> > > > ** **
> > > >
> > > > *From:*
spectrumanalyzer@yahoogroups.com</mc/compose?to=spectrumanalyzer%40yahoogroups.com><
> > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>[mailto:
> > > >
spectrumanalyzer@yahoogroups.com</mc/compose?to=spectrumanalyzer%40yahoogroups.com><
> > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>]
> >
> > > > *On Behalf Of *jghbeta
> > > > *Sent:* 18 June 2011 14:39
> > > > *To:*
spectrumanalyzer@yahoogroups.com</mc/compose?to=spectrumanalyzer%40yahoogroups.com><

> > http://mc/compose?to=spectrumanalyzer@yahoogroups.com>
> >
> > > > *Subject:* [spectrumanalyzer] MSA oscillation****
> > > >
> > > > ** **
> > > >
> > > > ****
> > > >
> > > >
> > > > I have someform of oscillation/ high noise that extends from 0 to about
> > 140
> > > > MHz. No signal gets thru even the zero hump disappears. beyond that,
> > there
> > > > is no noise and I getbnice, sharp clear signals. I just have the MSA
> > > > running. Any ideas?
> > > >
> > > > This site has become so quiet lately...
> > > >
> > > > Jim W1JGH****
> > > >
> > > > ****
> > > >
> > > >
> > > >
> > > >
> > > > --
> > > > Jim G. Hontoria
> > > >
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> > > --
> > > Jim G. Hontoria
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> Jim G. Hontoria
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Jim G. Hontoria

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Jim G. Hontoria

8228. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-24 18:27:27 UTC
From: inlinebeginner
Topic: 8178 Message: 8228

Sam
"Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct?"
Yes, I have to do so to make the color correct.

For the phase drop, that may caused by my Open calibration, where I did not extend the center pin to the plane. I can creat a OPEN cal kit to redo that.
Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Regarding the color. Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct? That would be very odd.
>
> Your graph looks good, but I noticed that the phase graph starts negative and steadily gets more negative. This means that on the Smith chart the graph would be a small arc rather than a single point. I'll take a shot in the dark and guess that you calibrated with commercial standards that have the open and short implemented at the front of the connector (i.e. the calibration plane is at the front), whereas you have the 83 ohm resistor mounted on the back of a connector. That means your true DUT is the resistor at the end of a short transmission line. That transmission line (the connector) creates the non-zero phase. If my guess is correct, you can eliminate the delay by adjusting Plane Extension to move the reference plane from the front to the back of the connector.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Sam
> > If you can put a reminder in your doc, it could be better.
> > After I did the PDM calibration, it is ok now, I put three photos here:
> > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/957908904/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> >
> > This is a 83 ohm resistor load, in reflection mode, I measured 12.2dB, the calculated value is 12.11dB.
> >
> > The glithes are gone on the HPF and cable phase.
> >
> > For the color problem, I found you setting is correct, but it does not disply correct, unless I doulbe click the scale open and close the pop windows.
> >
> > Thanks
> > Lin

> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > I suppose I should clarify in my "Initial Calibration" document that you must first calibrate the PDM inversion. This is a fairly automated procedure invoked through menu Setup->PDM Calibration, which opens a window that completely explains the procedure.
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > >
> > > > Sam
> > > > I just found some information on Soctty's website, looks like I did not do a PDM calibration. I will try it.
> > > > Lin
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > >
> > > > > Sam
> > > > > This is the doc that I followed during phase calibration:
> > > > > http://f1.grp.yahoofs.com/v1/EJACTlx-Ri7yiEitTvBWmHSD_h6VykoUjU4NWfv0l0q6C0aKRUPrPfoBnn2pl6dRKzdU4G57p-2VZLMZ6vH0_jz0vu-yIXPhJQtyu8U/InitialCal.pdf
> > > > > Thanks
> > > > > Lin
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > >
> > > > > > Sam
> > > > > > I just followed the steps your wrote in the inital calibration. Do you have another instruction to calibrate the phase detector?
> > > > > > Thanks
> > > > > > Lin
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > >
> > > > > > > Lin,
> > > > > > > From your description, I gathered that you cabled the TG to the MSA input, did a Through calibration, and then did a scan with the same cable in place. But the overall slant in the phase graph indicates that there was a length change between the calibration and the scan.
> > > > > > >
> > > > > > > I'm almost positive that the glitches are caused by an incorrect value for the PDM inversion. Did you follow the calibration procedure for determining that value? With an incorrect value, whenever the PDM is inverted, the phase value will be off by a fixed amount, which causes the phase graph to shift between two parallel paths. The shifts will occur both during calibration and during the cable scan, so you get more glitches than you might expect.
> > > > > > >
> > > > > > > Sam W.
> > > > > > >

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> > > > > > > >
> > > > > > > > To simplify the problem, I went back to VNA TX mode and meausre a cable.
Before VAN TX mode calibriation, the phase looks ok, but once I calibrate a 'through' I got
phase glitch.
> > > > > > > > I did do a initial phase cal. The cal data is different from your example.
> > > > > > > >
> > > > > > > > ----------
> > > > > > > > *Filter Path 1: CenterFreq=10.111660 MHz; Bandwidth=1.000000 kHz
> > > > > > > > *Calibrated 06/21/11 at 2.000000 MHz.
> > > > > > > > CalVersion= 1.03
> > > > > > > > MagTable=
> > > > > > > > * ADC dBm Phase in increasing order of ADC
> > > > > > > > 0 -120.000 2.19
> > > > > > > > 4965 -110.000 2.19
> > > > > > > > 4989 -107.500 2.19
> > > > > > > > 5041 -105.000 2.19
> > > > > > > > 5116 -102.500 2.19
> > > > > > > > 5249 -100.000 2.19
> > > > > > > > 5457 -97.500 2.19
> > > > > > > > 5817 -95.000 2.19
> > > > > > > > 6263 -92.500 2.19
> > > > > > > > 6816 -90.000 2.19
> > > > > > > > 7233 -88.401 2.19
> > > > > > > > 8063 -85.000 2.50
> > > > > > > > 9369 -80.000 3.04
> > > > > > > > 12015 -70.000 3.03
> > > > > > > > 14676 -60.000 3.07
> > > > > > > > 17392 -50.000 2.93
> > > > > > > > 20092 -40.000 2.74
> > > > > > > > 22828 -30.000 1.71
> > > > > > > > 25658 -20.000 0.00
> > > > > > > > 28446 -10.000 -0.15
> > > > > > > > 29106 -7.500 -0.15
> > > > > > > > 29755 -5.000 -0.15
> > > > > > > > 30336 -2.500 -0.15
> > > > > > > > 30720 0.000 -0.15
> > > > > > > > >
> > > > > > > > Thanks
> > > > > > > > Lin
> > > > > > > > >
> > > > > > > >
> > > > > > >
> > > > > >

> > > >
> > >
> >
>

8229. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-24 18:29:16 UTC
From: inlinebeginner
Topic: 8178 Message: 8229

Sam
During the PDM calibration, the font in that menu looks like too big on my computer, and I could not see all the letters in the small frame.
Lin

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> "Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct?"
> Yes, I have to do so to make the color correct.
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> > > > > > > >
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> > > > > > > > > * ADC dBm Phase in increasing order of ADC
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> > > > > > > > > 5041 -105.000 2.19
> > > > > > > > > 5116 -102.500 2.19
> > > > > > > > > 5249 -100.000 2.19
> > > > > > > > > 5457 -97.500 2.19
> > > > > > > > > 5817 -95.000 2.19
> > > > > > > > > 6263 -92.500 2.19
> > > > > > > > > 6816 -90.000 2.19
> > > > > > > > > 7233 -88.401 2.19
> > > > > > > > > 8063 -85.000 2.50
> > > > > > > > > 9369 -80.000 3.04
> > > > > > > > > 12015 -70.000 3.03
> > > > > > > > > 14676 -60.000 3.07
> > > > > > > > > 17392 -50.000 2.93
> > > > > > > > > 20092 -40.000 2.74
> > > > > > > > > 22828 -30.000 1.71
> > > > > > > > > 25658 -20.000 0.00
> > > > > > > > > 28446 -10.000 -0.15
> > > > > > > > > 29106 -7.500 -0.15
> > > > > > > > > 29755 -5.000 -0.15
> > > > > > > > > 30336 -2.500 -0.15

```
> > > > > > > > > 30720 0.000 -0.15
> > > > > > > > > >
> > > > > > > > > Thanks
> > > > > > > > > Lin
> > > > > > > > > >
> > > > > > > > >
> > > > > > > >
> > > > > > >
> > > > > >
> > > > >
> > >
>
```

8230. Latest Beta software

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-24 18:43:12 UTC
From: Sam
Topic: 8230 Message: 8230

I have posted in the Files section the latest beta version of the software (MSA_version116-4k...) This mostly has minor fixes from the previous version, some of which were mentioned in prior postings. Unless some bugs are found in the next week or so, this will likely become the next official release.

One interested feature that Scotty came up with is the ability to do phase noise plots. This only works for fairly noisy signals, since otherwise you will mostly be viewing the MSA's own phase noise. It can plot the noise on either side of a signal's center frequency, using the log scale normally used for such plots. The x-axis will display the offset from the center frequency, rather than the actual signal frequency. To use it you set the Base Frequency (Sweep Parameters window) to the signal center frequency, select a frequency range such as 1 kHz to 1 MHz, or -1 MHz to -1 kHz, (those values are offsets from the center frequency and select log sweep. Note that it was not possible before to do log sweeps with negative frequency values.

Sam W.

8231. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-24 20:39:05 UTC
From: Sam
Topic: 8178 Message: 8231

Which text is too big? Does it run off the right edge of the window, or is it truncated somewhat inside the edge?
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> During the PDM calibration, the font in that menu looks like too big on my computer, and I could not see all the letters in the small frame.
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Sam
> > "Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct?"
> > Yes, I have to do so to make the color correct.
> >
> > For the phase drop, that may caused by my Open calibration, where I did not extend the center pin to the plane. I can creat a OPEN cal kit to redo that.
> > Thanks
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > Regarding the color. Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct? That would be very odd.
> > >
> > > Your graph looks good, but I noticed that the phase graph starts negative and steadily gets more negative. This means that on the Smith chart the graph would be a small arc rather than a single point. I'll take a shot in the dark and guess that you calibrated with commercial standards that have the open and short implemented at the front of the connector (i.e. the calibration plane is at the front), whereas you have the 83 ohm resistor mounted on the back of a connector. That means your true DUT is the resistor at the end of a short transmission line. That transmission line (the connector) creates the non-zero phase. If my guess is correct, you can eliminate the delay by adjusting Plane Extension to move the reference plane from the front to the back of the connector.
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > >
> > > > Sam
> > > > If you can put a reminder in your doc, it could be better.
> > > > After I did the PDM calibration, it is ok now, I put three photos here:

> > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/957908904/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > >
> > > > This is a 83 ohm resistor load, in reflection mode, I measured 12.2dB, the calculated value is 12.11dB.
> > > >
> > > > The glithes are gone on the HPF and cable phase.
> > > >
> > > > For the color problem, I found you setting is correct, but it does not disply correct, unless I doulbe click the scale open and close the pop windows.
> > > >
> > > > Thanks
> > > > Lin
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > >
> > > > > I suppose I should clarify in my "Initial Calibration" document that you must first calibrate the PDM inversion. This is a fairly automated procedure invoked through menu Setup->PDM Calibration, which opens a window that completely explains the procedure.
> > > > > Sam W.
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > >
> > > > > > Sam
> > > > > > I just found some information on Soctty's website, looks like I did not do a PDM calibration. I will try it.
> > > > > > Lin
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > >
> > > > > > > Sam
> > > > > > > This is the doc that I followed during phase calibration:
> > > > > > > http://f1.grp.yahoofs.com/v1/EJACTlx-Ri7yiEitTvBWmHSD_h6VykoUjU4NWfv0l0q6C0aKRUPrPfoBnn2pl6dRKzdU4G57p-2VZLMZ6vH0_jz0vu-yIXPhJQtyu8U/InitialCal.pdf
> > > > > > > Thanks
> > > > > > > Lin
> > > > > > >
> > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > >
> > > > > > > > Sam
> > > > > > > > I just followed the steps your wrote in the inital calibration. Do you have another instruction to calibrate the phase detector?
> > > > > > > > Thanks
> > > > > > > > Lin
> > > > > > > >
> > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > > >

> > > > > > > > > Lin,
> > > > > > > > > > From your description, I gathered that you cabled the TG to the MSA input, did a Through calibration, and then did a scan with the same cable in place. But the overall slant in the phase graph indicates that there was a length change between the calibration and the scan.
> > > > > > > > >
> > > > > > > > > > I'm almost positive that the glitches are caused by an incorrect value for the PDM inversion. Did you follow the calibration procedure for determining that value? With an incorrect value, whenever the PDM is inverted, the phase value will be off by a fixed amount, which causes the phase graph to shift between two parallel paths. The shifts will occur both during calibration and during the cable scan, so you get more glitches than you might expect.
> > > > > > > > >
> > > > > > > > > > Sam W.
> > > > > > > > >
> > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > > > >
> > > > > > > > > > > Sam
> > > > > > > > > > > The phase sitll has glitch, see the photo here:
> > > > > > > > > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1301870247/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > > > > > > >
> > > > > > > > > > > To simplify the problem, I went back to VNA TX mode and meausre a cable. Before VAN TX mode calibriation, the phase looks ok, but once I calibrate a 'through' I got phase glitch.
> > > > > > > > > > I did do a initial phase cal. The cal data is different from your example.
> > > > > > > > > >
> > > > > > > > > > ----------
> > > > > > > > > > *Filter Path 1: CenterFreq=10.111660 MHz; Bandwidth=1.000000 kHz
> > > > > > > > > > *Calibrated 06/21/11 at 2.000000 MHz.
> > > > > > > > > > CalVersion= 1.03
> > > > > > > > > > MagTable=
> > > > > > > > > > * ADC dBm Phase in increasing order of ADC
> > > > > > > > > > 0 -120.000 2.19
> > > > > > > > > > 4965 -110.000 2.19
> > > > > > > > > > 4989 -107.500 2.19
> > > > > > > > > > 5041 -105.000 2.19
> > > > > > > > > > 5116 -102.500 2.19
> > > > > > > > > > 5249 -100.000 2.19
> > > > > > > > > > 5457 -97.500 2.19
> > > > > > > > > > 5817 -95.000 2.19
> > > > > > > > > > 6263 -92.500 2.19
> > > > > > > > > > 6816 -90.000 2.19
> > > > > > > > > > 7233 -88.401 2.19
> > > > > > > > > > 8063 -85.000 2.50
> > > > > > > > > > 9369 -80.000 3.04
> > > > > > > > > > 12015 -70.000 3.03
> > > > > > > > > > 14676 -60.000 3.07

```
> > > > > > > > > > 17392 -50.000 2.93
> > > > > > > > > > > 20092 -40.000 2.74
> > > > > > > > > > > 22828 -30.000 1.71
> > > > > > > > > > > 25658 -20.000 0.00
> > > > > > > > > > > 28446 -10.000 -0.15
> > > > > > > > > > > 29106 -7.500 -0.15
> > > > > > > > > > > 29755 -5.000 -0.15
> > > > > > > > > > > 30336 -2.500 -0.15
> > > > > > > > > > > 30720 0.000 -0.15
> > > > > > > > > > >
> > > > > > > > > > > Thanks
> > > > > > > > > > > Lin
> > > > > > > > > > >
> > > > > > > > > >
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8232. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-24 21:49:21 UTC
From: Sam
Topic: 8178 Message: 8232

Here is what I think happened with the color: For the Dark Appearance, normally phase is yellow and magnitude is blue. At some point you decided to reverse those colors, so you used the Y-axis windows to select the new colors for the traces. Then you saved those settings with Save Prefs. When the preference file is loaded at startup, your custom trace colors are used for the traces themselves, but the Dark Appearance settings are used for the color of the axis labels. I will see about fixing that, but here is a better way to make a permanent change to the color scheme:

1.Use menu Options->Appearances to open the Graph Appearance window.
2. Change the trace colors by clicking on the Y1 or Y2 box and then selecting the desired color.
3. When you have the colors you want, click Save as Preset. This lets you save the color scheme under a name that you chose. Enter the name and click Save. Your colors will now be implemented.
4. Use File->Save Prefs to update the preferences file to include the new color scheme in the list of Appearances, so it will still be available next time you start up.

From then on, when you start up, the colors will match the newly defined Appearance. If you want to temporarily select another appearance (such as Light for printing), you can do so in the Sweep Parameters window and later switch back to your custom Appearance by just selecting its name in the Appearances list.

On the other hand, if your reversal of the Dark colors was not intentional and you are OK with the default colors, you can restore them to their default values by selecting the Light Appearance and immediately selecting the Dark Appearance, which will override your custom trace color selection. You can then Save Prefs to make the change permanent.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> "Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct?"
> Yes, I have to do so to make the color correct.
>
> For the phase drop, that may caused by my Open calibration, where I did not extend the center pin to the plane. I can creat a OPEN cal kit to redo that.
> Thanks
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Regarding the color. Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct? That would be very odd.

> >
> > Your graph looks good, but I noticed that the phase graph starts negative and steadily gets more negative. This means that on the Smith chart the graph would be a small arc rather than a single point. I'll take a shot in the dark and guess that you calibrated with commercial standards that have the open and short implemented at the front of the connector (i.e. the calibration plane is at the front), whereas you have the 83 ohm resistor mounted on the back of a connector. That means your true DUT is the resistor at the end of a short transmission line. That transmission line (the connector) creates the non-zero phase. If my guess is correct, you can eliminate the delay by adjusting Plane Extension to move the reference plane from the front to the back of the connector.
> > Sam W.
> >

8233. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-26 01:31:24 UTC
From: inlinebeginner
Topic: 8178 Message: 8233

Sam
I will try what you said for the color.
For the 83 ohm phase tilt, I corrected today, the figures are here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/949537787/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc

As what you said, there is a very short lengh (might be 2mm) between the cal kit plan and the test fixture plane. After I created a set of cal kits, and use the same F connector for fxiture as cal kits used, the phase not is flat.
The resistor value is not 83 ohm, it is a 82.5 ohm 1%. the calculated return loss should be: 12.21dB typical, 12.04dB min, 12.37dB max
What I meausred is 12.244dB, which is very close to the typical value 12.21dB.
Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Here is what I think happened with the color: For the Dark Appearance, normally phase is yellow and magnitude is blue. At some point you decided to reverse those colors, so you used the Y-axis windows to select the new colors for the traces. Then you saved those settings with Save Prefs. When the preference file is loaded at startup, your custom trace colors are used for the traces themselves, but the Dark Appearance settings are used for the color of the axis labels. I will see about fixing that, but here is a better way to make a permanent change to the color scheme:
>
> 1.Use menu Options->Appearances to open the Graph Appearance window.
> 2. Change the trace colors by clicking on the Y1 or Y2 box and then selecting the desired color.
> 3. When you have the colors you want, click Save as Preset. This lets you save the color scheme under a name that you chose. Enter the name and click Save. Your colors will now be implemented.
> 4. Use File->Save Prefs to update the preferences file to include the new color scheme in the list of Appearances, so it will still be available next time you start up.
>
> From then on, when you start up, the colors will match the newly defined Appearance. If you want to temporarily select another appearance (such as Light for printing), you can do so in the Sweep Parameters window and later switch back to your custom Appearance by just selecting its name in the Appearances list.
>
> On the other hand, if your reversal of the Dark colors was not intentional and you are OK with the default colors, you can restore them to their default values by selecting the Light Appearance and immediately selecting the Dark Appearance, which will override your custom trace color selection. You can then Save Prefs to make the change permanent.
>
> Sam W.

>
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Sam
> > "Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct?"
> > Yes, I have to do so to make the color correct.
> >
> > For the phase drop, that may caused by my Open calibration, where I did not extend the center pin to the plane. I can creat a OPEN cal kit to redo that.
> > Thanks
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > Regarding the color. Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct? That would be very odd.
> > >
> > > Your graph looks good, but I noticed that the phase graph starts negative and steadily gets more negative. This means that on the Smith chart the graph would be a small arc rather than a single point. I'll take a shot in the dark and guess that you calibrated with commercial standards that have the open and short implemented at the front of the connector (i.e. the calibration plane is at the front), whereas you have the 83 ohm resistor mounted on the back of a connector. That means your true DUT is the resistor at the end of a short transmission line. That transmission line (the connector) creates the non-zero phase. If my guess is correct, you can eliminate the delay by adjusting Plane Extension to move the reference plane from the front to the back of the connector.
> > > Sam W.
> > >
>

8234. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-26 14:02:53 UTC
From: swetterlin
Topic: 8178 Message: 8234

Those results are excellent. Magnitude is right on, and phase is reasonably close to zero. At 1 GHz, 1 mm in a connector is about 1.75 degrees of phase delay, and for the round-trip represented by reflection it is double that. So it is hard to get picky about phase measurements at such frequencies unless you are confident all connectors--the ones used for calibration and the ones used for DUTs--are all exactly the same length with exactly the same electrical characteristics. I don't think quality is on the top of the manufacturer's mind for F connectors. But yours are giving good results.

Another point on color: each axis has a main color and two secondary colors. The secondary colors are used for reference lines, and in the Two-Port module for additional graphs on that axis. If you reverse the colors for the axes, you may want to reverse all of them. The idea was to use blues/greens for one axis and yellow/reds for the other, which makes it clearer which traces go with which axis. But, the bottom line is that the Appearances options are there so you can do it any way you want.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> I will try what you said for the color.
> For the 83 ohm phase tilt, I corrected today, the figures are here:
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/949537787/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
>
> As what you said, there is a very short lengh (might be 2mm) between the cal kit plan and the test fixture plane. After I created a set of cal kits, and use the same F connector for fxiture as cal kits used, the phase not is flat.
> The resistor value is not 83 ohm, it is a 82.5 ohm 1%. the calculated return loss should be: 12.21dB typical, 12.04dB min, 12.37dB max
> What I meausred is 12.244dB, which is very close to the typical value 12.21dB.
> Thanks
> Lin
>
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Here is what I think happened with the color: For the Dark Appearance, normally phase is yellow and magnitude is blue. At some point you decided to reverse those colors, so you used the Y-axis windows to select the new colors for the traces. Then you saved those settings with Save Prefs. When the preference file is loaded at startup, your custom trace colors are used for the traces themselves, but the Dark Appearance settings are used for the color of the axis labels. I will see about fixing that, but here is a better way to make a permanent change to the color scheme:
> >
> > 1.Use menu Options->Appearances to open the Graph Appearance window.

> > 2. Change the trace colors by clicking on the Y1 or Y2 box and then selecting the desired color.
> > 3. When you have the colors you want, click Save as Preset. This lets you save the color scheme under a name that you chose. Enter the name and click Save. Your colors will now be implemented.
> > 4. Use File->Save Prefs to update the preferences file to include the new color scheme in the list of Appearances, so it will still be available next time you start up.
> >
> > From then on, when you start up, the colors will match the newly defined Appearance. If you want to temporarily select another appearance (such as Light for printing), you can do so in the Sweep Parameters window and later switch back to your custom Appearance by just selecting its name in the Appearances list.
> >
> > On the other hand, if your reversal of the Dark colors was not intentional and you are OK with the default colors, you can restore them to their default values by selecting the Light Appearance and immediately selecting the Dark Appearance, which will override your custom trace color selection. You can then Save Prefs to make the change permanent.
> >
> > Sam W.
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > >
> > > Sam
> > > "Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct?"
> > > Yes, I have to do so to make the color correct.
> > >
> > > For the phase drop, that may caused by my Open calibration, where I did not extend the center pin to the plane. I can creat a OPEN cal kit to redo that.
> > > Thanks
> > > Lin
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >
> > > > Regarding the color. Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct? That would be very odd.
> > > >
> > > > Your graph looks good, but I noticed that the phase graph starts negative and steadily gets more negative. This means that on the Smith chart the graph would be a small arc rather than a single point. I'll take a shot in the dark and guess that you calibrated with commercial standards that have the open and short implemented at the front of the connector (i.e. the calibration plane is at the front), whereas you have the 83 ohm resistor mounted on the back of a connector. That means your true DUT is the resistor at the end of a short transmission line. That transmission line (the connector) creates the non-zero phase. If my guess is correct, you can eliminate the delay by adjusting Plane Extension to move the reference plane from the front to the back of the connector.
> > > > Sam W.
> > > >

> >
>

8235. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-26 23:30:37 UTC
From: inlinebeginner
Topic: 8178 Message: 8235

Sam
3G band PDM phase compensation might also need to inverse after we inverse the phase, otherwise, we will see this:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/2029992484/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc

Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, "swetterlin" <swetterlin@...> wrote:
>
> Those results are excellent. Magnitude is right on, and phase is reasonably close to zero. At 1 GHz, 1 mm in a connector is about 1.75 degrees of phase delay, and for the round-trip represented by reflection it is double that. So it is hard to get picky about phase measurements at such frequencies unless you are confident all connectors--the ones used for calibration and the ones used for DUTs--are all exactly the same length with exactly the same electrical characteristics. I don't think quality is on the top of the manufacturer's mind for F connectors. But yours are giving good results.
>
> Another point on color: each axis has a main color and two secondary colors. The secondary colors are used for reference lines, and in the Two-Port module for additional graphs on that axis. If you reverse the colors for the axes, you may want to reverse all of them. The idea was to use blues/greens for one axis and yellow/reds for the other, which makes it clearer which traces go with which axis. But, the bottom line is that the Appearances options are there so you can do it any way you want.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Sam
> > I will try what you said for the color.
> > For the 83 ohm phase tilt, I corrected today, the figures are here:
> > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/949537787/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> >
> > As what you said, there is a very short lengh (might be 2mm) between the cal kit plan and the test fixture plane. After I created a set of cal kits, and use the same F connector for fxiture as cal kits used, the phase not is flat.
> > The resistor value is not 83 ohm, it is a 82.5 ohm 1%. the calculated return loss should be: 12.21dB typical, 12.04dB min, 12.37dB max
> > What I meausred is 12.244dB, which is very close to the typical value 12.21dB.
> > Thanks
> > Lin
> >

> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > Here is what I think happened with the color: For the Dark Appearance, normally phase is yellow and magnitude is blue. At some point you decided to reverse those colors, so you used the Y-axis windows to select the new colors for the traces. Then you saved those settings with Save Prefs. When the preference file is loaded at startup, your custom trace colors are used for the traces themselves, but the Dark Appearance settings are used for the color of the axis labels. I will see about fixing that, but here is a better way to make a permanent change to the color scheme:
> > >
> > > 1.Use menu Options->Appearances to open the Graph Appearance window.
> > > 2. Change the trace colors by clicking on the Y1 or Y2 box and then selecting the desired color.
> > > 3. When you have the colors you want, click Save as Preset. This lets you save the color scheme under a name that you chose. Enter the name and click Save. Your colors will now be implemented.
> > > 4. Use File->Save Prefs to update the preferences file to include the new color scheme in the list of Appearances, so it will still be available next time you start up.
> > >
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8236. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-27 00:42:58 UTC
From: swetterlin
Topic: 8178 Message: 8236

Lin,
Everything in 3G is like looking in a mirror so it's easy to get something backwards. I'm not sure why this would not have shown up earlier though. What did you get for your PDM inversion? If it differs from 180 by about 18 degrees or so then I would guess you are correct.
Sam W.

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> Thanks
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> > > For the 83 ohm phase tilt, I corrected today, the figures are here:
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8237. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-27 01:34:47 UTC
From: inlinebeginner
Topic: 8178 Message: 8237

Sam
The photo shows there are two steps during the phase inversion, the first is the original, and the second is the same as the first. I think the second is the PDM correction data, it just compensate in a wrong direction.
Lin

--- In spectrumanalyzer@yahoogroups.com, "swetterlin" <swetterlin@...> wrote:
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8238. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-27 14:21:16 UTC
From: Sam
Topic: 8178 Message: 8238

Yes, the negation of phase in 3G should occur after the PDM inversion is applied, and after applying the phase correction from phase calibration. To fix that, locate this line:

if FreqMode=3 then phase=0-phase

and move it several lines down so it occurs immediately after this line:

phase=phase-difPhase

Hopefully, that will do the trick.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
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8239. IFR A7550 Spectrum analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-27 21:04:56 UTC
From: Don
Topic: 8239 Message: 8239

Hi all,

Just joined this group. I have the option of buying an IFR A7550 SpecAn. The machine powers up just fine and displays the graticule and the center frequency, ref level, sweep rate and Res BW on the screen. Also shows a trace on the screen. There is an "UNCAL" message on the screen where it usually shows the graticule unit (dBm, dBV etc). Reading the manual, it appears that the "UNCAL" message appears if the sweep rate is not optimal for the selected sweep width and RBW. I think if I can reduce the sweep rate, that the "UNCAL" message will go away. The problem is that NONE of the keys on the keypad do anything when pressed. Any idea if this is a simple fix or if I should stay away from it? TIA for your opinions.

8240. Re: IFR A7550 Spectrum analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-27 22:00:56 UTC
From: Don
Topic: 8239 Message: 8240

My apologies to the members of this Forum for posting inappropriately. I found this Forum while searching for info on the IFR A7550 spectrum analyzer and found a thread discussing said spectrum analyzer and therefore (erroneously) assumed that this was a general Spectrum analyzer Forum. A Forum member kindly contacted me offline and informed me that this Forum was specifically for a home brew Spectrum analyzer. Please disregard my original post (although if any of you have any opinions on it, I would like to hear them)

Don

--- In spectrumanalyzer@yahoogroups.com, "Don" <donald_s_58103@...> wrote:
>
> Hi all,
>
> Just joined this group. I have the option of buying an IFR A7550 SpecAn. The machine powers up just fine and displays the graticule and the center frequency, ref level, sweep rate and Res BW on the screen. Also shows a trace on the screen. There is an "UNCAL" message on the screen where it usually shows the graticule unit (dBm, dBV etc). Reading the manual, it appears that the "UNCAL" message appears if the sweep rate is not optimal for the selected sweep width and RBW. I think if I can reduce the sweep rate, that the "UNCAL" message will go away. The problem is that NONE of the keys on the keypad do anything when pressed. Any idea if this is a simple fix or if I should stay away from it? TIA for your opinions.
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8241. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-28 03:28:21 UTC
From: inlinebeginner
Topic: 8178 Message: 8241

Sam
To fix the 3G band VNA mode phase:
original: phase = phase - (180+PDMinversionDeviation)
after fix:
if FreqMode=3 then phase = phase + (180+PDMinversionDeviation) else phase = phase - (180+PDMinversionDeviation)

I tried with above fix, 1G, 2G and 3G band phase are all correct. The code around that area with the fix should be:

```
....
if FreqMode=3 then phase=0-phase 'For 3G mode, true phase is negative of measured phase,
due to low side LO1 ver116-1b
'if PDM was inverted, subtract the inverted phase change
'The deviation in the PDM inversion from theoretical 180 deg is actually a fixed time
period
'invdeg is maintained as the actual inversion that occurs at 10.7 MHz. With a different
finalfreq,
'the deviation from 180 degrees will change.
if phaarray(thisstep,0)=1 then 'ver116-1b
PDMinversionDeviation=(invdeg-180)*finalfreq/10.7
if FreqMode=3 then phase = phase + (180+PDMinversionDeviation) else phase = phase -
(180+PDMinversionDeviation)
end if
phase=phase-difPhase 'SEW3: subtract correction for change of phase over signal level.

.....
```

Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Yes, the negation of phase in 3G should occur after the PDM inversion is applied, and after applying the phase correction from phase calibration. To fix that, locate this line:
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> if FreqMode=3 then phase=0-phase
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> and move it several lines down so it occurs immediately after this line:
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> phase=phase-difPhase
>
> Hopefully, that will do the trick.
>
> Sam W.
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8242. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-28 11:54:09 UTC
From: inlinebeginner
Topic: 8178 Message: 8242

Sam
For the PDM calibiration menu fonts size problem on my PC, I put a photo here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/46578931/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
Thanks
Lin

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> original: phase = phase - (180+PDMinversionDeviation)
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> if FreqMode=3 then phase=0-phase 'For 3G mode, true phase is negative of measured phase, due to low side LO1 ver116-1b
> 'if PDM was inverted, subtract the inverted phase change
> 'The deviation in the PDM inversion from theoretical 180 deg is actually a fixed time period
> 'invdeg is maintained as the actual inversion that occurs at 10.7 MHz. With a different finalfreq,
> 'the deviation from 180 degrees will change.
> if phaarray(thisstep,0)=1 then 'ver116-1b
> PDMinversionDeviation=(invdeg-180)*finalfreq/10.7
> if FreqMode=3 then phase = phase + (180+PDMinversionDeviation) else phase = phase - (180+PDMinversionDeviation)
> end if
> phase=phase-difPhase 'SEW3: subtract correction for change of phase over signal level.
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> .....
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> Thanks
> Lin
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> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > Yes, the negation of phase in 3G should occur after the PDM inversion is applied, and

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8243. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-28 14:04:09 UTC
From: Sam
Topic: 8178 Message: 8243

It would be better just to move the line that negates phase, per my prior posting. That will also take care of the (small) adjustment that occurs due to phase calibration.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
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> original: phase = phase - (180+PDMinversionDeviation)
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8244. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-28 14:07:05 UTC
From: Sam
Topic: 8178 Message: 8244

So the window text is fine; the problem is with the button text. The buttons used the default text, which depends on your Windows theme settings. I have changed the code to use a specific, small font.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
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8245. Latest Bill of Materials

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-28 15:06:32 UTC
From: Eric Nystrom
Topic: 8245 Message: 8245

I am working on building the PLO modules and have a couple of questions.

I ordered from the BOM dated 2/13/2011

The BOM shows 10 75 ohm 1/4 w should be ordered, but the quantity in parenthesis is 16.

The total ordered should be changed to 20.

The BOM orders 10 68 pf capacitors, while the PLL schematic and parts list shows 680 pf
for C1 and C48.

Which is correct?

Eric Nystrom

8246. Re: Latest Bill of Materials

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-28 15:32:45 UTC
From: Sam
Topic: 8245 Message: 8246

You are correct on the qty 20 resistors. The capacitors should be 680 pF per the schematic, which is Digi-Key 311-1121-1-ND.

Thanks for the catch. I have uploaded the corrected BOM.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
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> The BOM shows 10 75 ohm 1/4 w should be ordered, but the quantity in parenthesis
> is 16.
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> The total ordered should be changed to 20.
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> The BOM orders 10 68 pf capacitors, while the PLL schematic and parts list shows
> 680 pf
> for C1 and C48.
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> Which is correct?
>
> Eric Nystrom
>

8247. Re: [spectrumanalyzer] Re: Latest Bill of Materials

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-28 16:01:46 UTC
From: Eric Nystrom
Topic: 8245 Message: 8247

Sam,

I was reviewing the other schematics and it looks like the 68 pf are needed on
the
mixer 2, so they should stay on the BOM. It appears the 680 pf were an
omission.

Eric Nystrom

From: Sam <swetterlin@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Tue, June 28, 2011 11:32:45 AM
Subject: [spectrumanalyzer] Re: Latest Bill of Materials

You are correct on the qty 20 resistors. The capacitors should be 680 pF per the
schematic, which is Digi-Key 311-1121-1-ND.

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8248. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-28 16:15:44 UTC
From: inlinebeginner
Topic: 8178 Message: 8248

Sam
I tried this line:
> > phase=phase-difPhase

For some reason, it does not work, that is why I added that fix. You may try on your MSA, in VNA transmission mode, with a cable between TG output and SA input.
Thanks
Lincheng Xiu

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
>
> It would be better just to move the line that negates phase, per my prior posting. That will also take care of the (small) adjustment that occurs due to phase calibration.
> Sam W.
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> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Sam
> > To fix the 3G band VNA mode phase:
> > original: phase = phase - (180+PDMinversionDeviation)
> > after fix:
> > if FreqMode=3 then phase = phase + (180+PDMinversionDeviation) else phase = phase - (180+PDMinversionDeviation)
> >
> > I tried with above fix, 1G, 2G and 3G band phase are all correct. The code around that area with the fix should be:
> >
> > ....
> > if FreqMode=3 then phase=0-phase 'For 3G mode, true phase is negative of measured phase, due to low side LO1 ver116-1b
> > 'if PDM was inverted, subtract the inverted phase change
> > 'The deviation in the PDM inversion from theoretical 180 deg is actually a fixed time period
> > 'invdeg is maintained as the actual inversion that occurs at 10.7 MHz. With a different finalfreq,
> > 'the deviation from 180 degrees will change.
> > if phaarray(thisstep,0)=1 then 'ver116-1b
> > PDMinversionDeviation=(invdeg-180)*finalfreq/10.7
> > if FreqMode=3 then phase = phase + (180+PDMinversionDeviation) else phase = phase - (180+PDMinversionDeviation)
> > end if
> > phase=phase-difPhase 'SEW3: subtract correction for change of phase over signal level.
> >
> > .....

> >
> > Thanks
> > Lin
> >
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > Yes, the negation of phase in 3G should occur after the PDM inversion is applied, and after applying the phase correction from phase calibration. To fix that, locate this line:
> > >
> > > if FreqMode=3 then phase=0-phase
> > >
> > > and move it several lines down so it occurs immediately after this line:
> > >
> > > phase=phase-difPhase
> > >
> > > Hopefully, that will do the trick.
> > >
> > > Sam W.
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> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
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> > > > Sam
> > > > The photo shows there are two steps during the phase inversion, the first is the original, and the second is the same as the first. I think the second is the PDM correction data, it just compensate in a wrong direction.
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> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "swetterlin" <swetterlin@> wrote:
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> > > > > Lin,
> > > > > Everything in 3G is like looking in a mirror so it's easy to get something backwards. I'm not sure why this would not have shown up earlier though. What did you get for your PDM inversion? If it differs from 180 by about 18 degrees or so then I would guess you are correct.
> > > > > Sam W.
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> > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
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> > > > > > Sam
> > > > > > 3G band PDM phase compensation might also need to inverse after we inverse the phase, otherwise, we will see this:
> > > > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/2029992484/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
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> > > > > > Thanks
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> > > > > > --- In spectrumanalyzer@yahoogroups.com, "swetterlin" <swetterlin@> wrote:
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> > > > > > > Those results are excellent. Magnitude is right on, and phase is reasonably close to zero. At 1 GHz, 1 mm in a connector is about 1.75 degrees of phase delay, and for the round-trip represented by reflection it is double that. So it is hard to get picky about phase measurements at such frequencies unless you are confident all connectors--the ones used for calibration and the ones used for DUTs--are all exactly the same length with exactly the same electrical characteristics. I don't think quality is on the top of the manufacturer's mind for F connectors. But yours are giving good results.
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> > > > > > > Another point on color: each axis has a main color and two secondary colors. The secondary colors are used for reference lines, and in the Two-Port module for additional graphs on that axis. If you reverse the colors for the axes, you may want to reverse all of them. The idea was to use blues/greens for one axis and yellow/reds for the other, which makes it clearer which traces go with which axis. But, the bottom line is that the Appearances options are there so you can do it any way you want.
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> > > > > > > > The resistor value is not 83 ohm, it is a 82.5 ohm 1%. the calculated return loss should be: 12.21dB typical, 12.04dB min, 12.37dB max
> > > > > > > > What I meausred is 12.244dB, which is very close to the typical value 12.21dB.
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> > > > > > > > >
> > > > > > > > > Here is what I think happened with the color: For the Dark Appearance, normally phase is yellow and magnitude is blue. At some point you decided to reverse those colors, so you used the Y-axis windows to select the new colors for the traces. Then you saved those settings with Save Prefs. When the preference file is loaded at startup, your custom trace colors are used for the traces themselves, but the Dark Appearance settings are used for the color of the axis labels. I will see about fixing that, but here is a better way to make a permanent change to the color scheme:
> > > > > > > >

> > > > > > > > > 1.Use menu Options->Appearances to open the Graph Appearance window.
> > > > > > > > > 2. Change the trace colors by clicking on the Y1 or Y2 box and then selecting the desired color.
> > > > > > > > > 3. When you have the colors you want, click Save as Preset. This lets you save the color scheme under a name that you chose. Enter the name and click Save. Your colors will now be implemented.
> > > > > > > > > 4. Use File->Save Prefs to update the preferences file to include the new color scheme in the list of Appearances, so it will still be available next time you start up.
> > > > > > > > >
> > > > > > > > > From then on, when you start up, the colors will match the newly defined Appearance. If you want to temporarily select another appearance (such as Light for printing), you can do so in the Sweep Parameters window and later switch back to your custom Appearance by just selecting its name in the Appearances list.
> > > > > > > > >
> > > > > > > > > On the other hand, if your reversal of the Dark colors was not intentional and you are OK with the default colors, you can restore them to their default values by selecting the Light Appearance and immediately selecting the Dark Appearance, which will override your custom trace color selection. You can then Save Prefs to make the change permanent.
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> > > > > > > > > Sam W.
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> > > > > > > > > Yes, I have to do so to make the color correct.
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> > > > > > > > > For the phase drop, that may caused by my Open calibration, where I did not extend the center pin to the plane. I can creat a OPEN cal kit to redo that.
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creates the non-zero phase. If my guess is correct, you can eliminate the delay by adjusting Plane Extension to move the reference plane from the front to the back of the connector.

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8249. Re: VNA reflection mode questions for V116_4i_beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-28 16:31:23 UTC
From: Sam
Topic: 8178 Message: 8249

You don't add that line; rather, you move another line to place it after that line:

Locate this line:

if FreqMode=3 then phase=0-phase

and move it several lines down so it occurs immediately after this line:

phase=phase-difPhase

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
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> Sam
> I tried this line:
> > > phase=phase-difPhase
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> For some reason, it does not work, that is why I added that fix. You may try on your MSA, in VNA transmission mode, with a cable between TG output and SA input.
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> > > if FreqMode=3 then phase=0-phase 'For 3G mode, true phase is negative of measured phase, due to low side LO1 ver116-1b

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> > > PDMinversionDeviation=(invdeg-180)*finalfreq/10.7
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> > > end if
> > > phase=phase-difPhase 'SEW3: subtract correction for change of phase over signal level.
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8250. Re: Latest Bill of Materials

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-28 16:36:39 UTC
From: Sam
Topic: 8245 Message: 8250

OK, I added the 68 pF back in. I also noticed that I had the correct Digi-Key number for the 680 pF, but not the right manufacturer's part number. It is now fixed.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> Sam,
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> I was reviewing the other schematics and it looks like the 68 pf are needed on
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> Eric Nystrom
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> _____
> From: Sam <swetterlin@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Tue, June 28, 2011 11:32:45 AM
> Subject: [spectrumanalyzer] Re: Latest Bill of Materials
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> You are correct on the qty 20 resistors. The capacitors should be 680 pF per the
> schematic, which is Digi-Key 311-1121-1-ND.
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> Thanks for the catch. I have uploaded the corrected BOM.
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> > Eric Nystrom
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8251. Re: VNA reflection mode questions for V116_4i_beta; now V116_4L_Beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-28 19:48:42 UTC
From: Sam
Topic: 8178 Message: 8251

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Sam W.

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8252. More Bill of Materials Updates

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-28 22:41:43 UTC
From: Eric Nystrom
Topic: 8245 Message: 8252

It appears that R3 (PLO board) a 470 ohm resistor is missing from the latest BOM also.

I assume the .0051 uf are to be used for C3 .005 uf on the PLO board.

One other thing relating to the BOM. 10uf 0805 X5R capacitors replaced the polarized
capacitors the boards were laid out for. It is a bit of a stretch fitting the 0805 on the pads.
Not sure of the original package, but it seems that a 1206 would be a better fit something
like a Digi Key 399-5091-1-ND

http://search.digikey.com/scripts/DkSearch/dksus.dll?Detail&name=399-5091-1-ND

Eric Nystrom

8253. Re: VNA reflection mode questions for V116_4i_beta; now V116_4L_Beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-29 03:45:19 UTC
From: inlinebeginner
Topic: 8178 Message: 8253

Sam
116_4L_Beta fixed all the problems.
1) 3G phase fixed;
2) PDM menu botton font size fixed;
3) Axis Clolor matchs with its curve color, fixed
Thanks
Lin

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8254. Re: More Bill of Materials Updates

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-29 13:05:34 UTC
From: Sam
Topic: 8245 Message: 8254

Yes, I think the 470 ohm value was a change made after the original BOM (the one I started from when I did my update) was made. You are correct that the 0.005 uF capacitors on the schematic have an actual value of 0.0051 uF.

I picked the size 0805 10uF/16V caps to distinguish them from the size 1206 25V caps, but as you say, since the pads are 1206 that would be a better size to use. I imagine that the 25V caps are fatter than the 10V caps anyway.

I'll wait to see whether you discover any other discrepancies before posting a corrected BOM.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
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> It appears that R3 (PLO board) a 470 ohm resistor is missing from the latest BOM
> also.
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> I assume the .0051 uf are to be used for C3 .005 uf on the PLO board.
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> One other thing relating to the BOM. 10uf 0805 X5R capacitors replaced the
> polarized
> capacitors the boards were laid out for. It is a bit of a stretch fitting the
> 0805 on the pads.
> Not sure of the original package, but it seems that a 1206 would be a better fit
> something
> like a Digi Key 399-5091-1-ND
>
> http://search.digikey.com/scripts/DkSearch/dksus.dll?Detail&name=399-5091-1-ND
>
> Eric Nystrom
>

8255. Re: [spectrumanalyzer] Re: More Bill of Materials Updates

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-29 23:31:06 UTC
From: Eric Nystrom
Topic: 8245 Message: 8255

Sam,

The 25 volt caps on the power and control board were 0805 also. I double checked the BOM to make sure I did not make
a mistake in my order. It would be better if they were 1206 also.

I hope to have all the boards built within a couple of weeks so I will let you know if I find any
other missing parts. I am waiting until I am done to place my next order.

Eric Nystrom

From: Sam <swetterlin@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Wed, June 29, 2011 9:05:34 AM
Subject: [spectrumanalyzer] Re: More Bill of Materials Updates

Yes, I think the 470 ohm value was a change made after the original BOM (the one I started from when I did my update) was made. You are correct that the 0.005 uF capacitors on the schematic have an actual value of 0.0051 uF.

I picked the size 0805 10uF/16V caps to distinguish them from the size 1206 25V caps, but as you say, since the pads are 1206 that would be a better size to use. I imagine that the 25V caps are fatter than the 10V caps anyway.

I'll wait to see whether you discover any other discrepancies before posting a corrected BOM.

Sam W.

8256. Getting a Phase Noise Plot

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-30 15:00:22 UTC
From: nealmartini
Topic: 8256 Message: 8256

Scotty,

I am trying to get a close in look at the performance of a signal source that runs at 620 MHz. I'd like to get a plot that goes from 1k to 1 M from the 620 MHz with a logrithmic x axis on the plot. I know how you got the phsae noise plot you posted for the SA's internal local oscillator, but was wondering how I might use the SA to generate a similar plot without replumbing the SA.

Any suggestions would be appreciated.

Neal

8257. Re: Getting a Phase Noise Plot

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-30 15:19:08 UTC
From: Sam
Topic: 8256 Message: 8257

Neal
You need to use the latest beta software to get the log plot you are looking for:
1.Set the Base Frequency to 620 MHz.
2.Set the sweep range to start at 0.001 MHz and end at 1 MHz. Specify log sweep.
3. Use your narrowest RBW.

This will give you the desired sweep. The frequency axis will show the offsets from 620 MHz, rather than the net frequency. But keep in mind that your signal must have noise or spurs higher than the internal MSA phase noise in order for you to see anything useful.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> Scotty,
>
> I am trying to get a close in look at the performance of a signal source that runs at 620 MHz. I'd like to get a plot that goes from 1k to 1 M from the 620 MHz with a logrithmic x axis on the plot. I know how you got the phsae noise plot you posted for the SA's internal local oscillator, but was wondering how I might use the SA to generate a similar plot without replumbing the SA.
>
> Any suggestions would be appreciated.
>
> Neal
>

8258. Re: Latest Beta software

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-30 21:13:25 UTC
From: forbes3100
Topic: 8230 Message: 8258

Hi Sam,

Group delay seems to be broken in 116-4L (and i). I'm seeing a constant -2.78k instead of the result I see in 115-9e. It's only the "Grp Del(sec)" data that's wrong though-- "S21 Group Delay" is correct.

--Scott

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have posted in the Files section the latest beta version of the software (MSA_version116-4k...) This mostly has minor fixes from the previous version, some of which were mentioned in prior postings. Unless some bugs are found in the next week or so, this will likely become the next official release.
>
> One interested feature that Scotty came up with is the ability to do phase noise plots. This only works for fairly noisy signals, since otherwise you will mostly be viewing the MSA's own phase noise. It can plot the noise on either side of a signal's center frequency, using the log scale normally used for such plots. The x-axis will display the offset from the center frequency, rather than the actual signal frequency. To use it you set the Base Frequency (Sweep Parameters window) to the signal center frequency, select a frequency range such as 1 kHz to 1 MHz, or -1 MHz to -1 kHz, (those values are offsets from the center frequency and select log sweep. Note that it was not possible before to do log sweeps with negative frequency values.
>
> Sam W.
>

8259. Re: Latest Beta software

Yahoo group: spectrumanalyzer (2011)
Date: 2011-06-30 23:44:09 UTC
From: Sam
Topic: 8230 Message: 8259

Scott,
If you are willing to tinker with the code, find this line in uBestFitLine:

x=ReflectArray(i,0)

and change it to this:

x=ActualSignalFrequency(datatable(i,1))

That should fix it, though I have not tested it on real data.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "forbes3100" <forbes3100@...> wrote:
>
> Hi Sam,
>
> Group delay seems to be broken in 116-4L (and i). I'm seeing a constant -2.78k instead of the result I see in 115-9e. It's only the "Grp Del(sec)" data that's wrong though-- "S21 Group Delay" is correct.
>
> --Scott
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > I have posted in the Files section the latest beta version of the software (MSA_version116-4k...) This mostly has minor fixes from the previous version, some of which were mentioned in prior postings. Unless some bugs are found in the next week or so, this will likely become the next official release.
> >
> > One interested feature that Scotty came up with is the ability to do phase noise plots. This only works for fairly noisy signals, since otherwise you will mostly be viewing the MSA's own phase noise. It can plot the noise on either side of a signal's center frequency, using the log scale normally used for such plots. The x-axis will display the offset from the center frequency, rather than the actual signal frequency. To use it you set the Base Frequency (Sweep Parameters window) to the signal center frequency, select a frequency range such as 1 kHz to 1 MHz, or -1 MHz to -1 kHz, (those values are offsets from the center frequency and select log sweep. Note that it was not possible before to do log sweeps with negative frequency values.
> >
> > Sam W.
> >
>

8260. Re: Latest Beta software

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-01 00:35:56 UTC
From: forbes3100
Topic: 8230 Message: 8260

Sam,
That works, and checks out on a genuine L and C too. --Thanks

--Scott

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Scott,
> If you are willing to tinker with the code, find this line in uBestFitLine:
>
> x=ReflectArray(i,0)
>
> and change it to this:
>
> x=ActualSignalFrequency(datatable(i,1))
>
> That should fix it, though I have not tested it on real data.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "forbes3100" <forbes3100@> wrote:
> >
> > Hi Sam,
> >
> > Group delay seems to be broken in 116-4L (and i). I'm seeing a constant -2.78k instead of the result I see in 115-9e. It's only the "Grp Del(sec)" data that's wrong though-- "S21 Group Delay" is correct.
> >
> > --Scott
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > I have posted in the Files section the latest beta version of the software (MSA_version116-4k...) This mostly has minor fixes from the previous version, some of which were mentioned in prior postings. Unless some bugs are found in the next week or so, this will likely become the next official release.
> > >
> > > One interested feature that Scotty came up with is the ability to do phase noise plots. This only works for fairly noisy signals, since otherwise you will mostly be viewing the MSA's own phase noise. It can plot the noise on either side of a signal's center frequency, using the log scale normally used for such plots. The x-axis will display the offset from the center frequency, rather than the actual signal frequency. To use it you set the Base Frequency (Sweep Parameters window) to the signal center frequency, select a frequency range such as 1 kHz to 1 MHz, or -1 MHz to -1 kHz, (those values are offsets from the center frequency and select log sweep. Note that it was not possible before to do log sweeps with negative frequency values.

> > >
> > > Sam W.
> > >
> >
>

8261. Re: VNA reflection mode questions for V116_4i_beta; now V116_4L_Beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-01 12:48:31 UTC
From: inlinebeginner
Topic: 8178 Message: 8261

Sam
You might want to fix the similar font size problem for:
1) Configureation manager
2) Sepcial test
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/115723472/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc

some other menus may also need to change the same font size for better looking.
Thanks

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> 116_4L_Beta fixed all the problems.
> 1) 3G phase fixed;
> 2) PDM menu botton font size fixed;
> 3) Axis Clolor matchs with its curve color, fixed
> Thanks
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > I posted new beta software with this fix. In the course of testing this, I also discovered that the previous beta had an error that could disrupt the TG. I tested at 1G and 3G; my 1G/2G band switch is at the moment de-installed.
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > You don't add that line; rather, you move another line to place it after that line:
> > >
> > > Locate this line:
> > >
> > > if FreqMode=3 then phase=0-phase
> > >
> > > and move it several lines down so it occurs immediately after this line:
> > >
> > > phase=phase-difPhase
> > >
> > > Sam W.
> > >
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > >

> > > > Sam
> > > > I tried this line:
> > > > > > phase=phase-difPhase
> > > >
> > > > For some reason, it does not work, that is why I added that fix. You may try on your MSA, in VNA transmission mode, with a cable between TG output and SA input.
> > > > Thanks
> > > > Lincheng Xiu
> > > >
> > > >
> > > > --- In spectrumanalyzer@...m, "Sam" <swetterlin@> wrote:
> > > > >
> > > > >
> > > > > It would be better just to move the line that negates phase, per my prior posting. That will also take care of the (small) adjustment that occurs due to phase calibration.
> > > > > Sam W.
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > >
> > > > > > Sam
> > > > > > To fix the 3G band VNA mode phase:
> > > > > > original: phase = phase - (180+PDMinversionDeviation)
> > > > > > after fix:
> > > > > > if FreqMode=3 then phase = phase + (180+PDMinversionDeviation) else phase = phase - (180+PDMinversionDeviation)
> > > > > >
> > > > > > I tried with above fix, 1G, 2G and 3G band phase are all correct. The code around that area with the fix should be:
> > > > > >
> > > > > > ....
> > > > > > if FreqMode=3 then phase=0-phase 'For 3G mode, true phase is negative of measured phase, due to low side LO1 ver116-1b
> > > > > > 'if PDM was inverted, subtract the inverted phase change
> > > > > > 'The deviation in the PDM inversion from theoretical 180 deg is actually a fixed time period
> > > > > > 'invdeg is maintained as the actual inversion that occurs at 10.7 MHz. With a different finalfreq,
> > > > > > 'the deviation from 180 degrees will change.
> > > > > > if phaarray(thisstep,0)=1 then 'ver116-1b
> > > > > > PDMinversionDeviation=(invdeg-180)*finalfreq/10.7
> > > > > > if FreqMode=3 then phase = phase + (180+PDMinversionDeviation) else phase = phase - (180+PDMinversionDeviation)
> > > > > > end if
> > > > > > phase=phase-difPhase 'SEW3: subtract correction for change of phase over signal level.
> > > > > >
> > > > > > .....
> > > > > >

> > > > > > Thanks
> > > > > > Lin
> > > > > >
> > > > > >
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > >
> > > > > > > Yes, the negation of phase in 3G should occur after the PDM inversion is applied, and after applying the phase correction from phase calibration. To fix that, locate this line:
> > > > > > >
> > > > > > > if FreqMode=3 then phase=0-phase
> > > > > > >
> > > > > > > and move it several lines down so it occurs immediately after this line:
> > > > > > >
> > > > > > > phase=phase-difPhase
> > > > > > >
> > > > > > > Hopefully, that will do the trick.
> > > > > > >
> > > > > > > Sam W.
> > > > > > >
> > > > > > >
> > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > >
> > > > > > > > Sam
> > > > > > > > The photo shows there are two steps during the phase inversion, the first is the original, and the second is the same as the first. I think the second is the PDM correction data, it just compensate in a wrong direction.
> > > > > > > > Lin
> > > > > > > >
> > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "swetterlin" <swetterlin@> wrote:
> > > > > > > > >
> > > > > > > > > Lin,
> > > > > > > > > Everything in 3G is like looking in a mirror so it's easy to get something backwards. I'm not sure why this would not have shown up earlier though. What did you get for your PDM inversion? If it differs from 180 by about 18 degrees or so then I would guess you are correct.
> > > > > > > > > Sam W.
> > > > > > > > >
> > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > > > >
> > > > > > > > > > Sam
> > > > > > > > > > 3G band PDM phase compensation might also need to inverse after we inverse the phase, otherwise, we will see this:
> > > > > > > > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/2029992484/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > > > > > > >
> > > > > > > > > > Thanks

> > > > > > > > > > Lin
> > > > > > > > > >
> > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "swetterlin" <swetterlin@>
wrote:
> > > > > > > > > >
> > > > > > > > > > > Those results are excellent. Magnitude is right on, and phase is
reasonably close to zero. At 1 GHz, 1 mm in a connector is about 1.75 degrees of phase
delay, and for the round-trip represented by reflection it is double that. So it is hard to
get picky about phase measurements at such frequencies unless you are confident all
connectors--the ones used for calibration and the ones used for DUTs--are all exactly the
same length with exactly the same electrical characteristics. I don't think quality is on
the top of the manufacturer's mind for F connectors. But yours are giving good results.
> > > > > > > > > > >
> > > > > > > > > > > Another point on color: each axis has a main color and two secondary
colors. The secondary colors are used for reference lines, and in the Two-Port module for
additional graphs on that axis. If you reverse the colors for the axes, you may want to
reverse all of them. The idea was to use blues/greens for one axis and yellow/reds for the
other, which makes it clearer which traces go with which axis. But, the bottom line is that
the Appearances options are there so you can do it any way you want.
> > > > > > > > > > >
> > > > > > > > > > > Sam W.
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner"
<inlinebeginner@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > Sam
> > > > > > > > > > > I will try what you said for the color.
> > > > > > > > > > > For the 83 ohm phase tilt, I corrected today, the figures are here:
> > > > > > > > > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125
393/pic/949537787/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > > > > > > > >
> > > > > > > > > > > As what you said, there is a very short lengh (might be 2mm)
between the cal kit plan and the test fixture plane. After I created a set of cal kits, and
use the same F connector for fxiture as cal kits used, the phase not is flat.
> > > > > > > > > > > The resistor value is not 83 ohm, it is a 82.5 ohm 1%. the
calculated return loss should be: 12.21dB typical, 12.04dB min, 12.37dB max
> > > > > > > > > > > What I meausred is 12.244dB, which is very close to the typical
value 12.21dB.
> > > > > > > > > > > Thanks
> > > > > > > > > > > Lin
> > > > > > > > > > >
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > Here is what I think happened with the color: For the Dark
Appearance, normally phase is yellow and magnitude is blue. At some point you decided to
reverse those colors, so you used the Y-axis windows to select the new colors for the
traces. Then you saved those settings with Save Prefs. When the preference file is loaded
at startup, your custom trace colors are used for the traces themselves, but the Dark
Appearance settings are used for the color of the axis labels. I will see about fixing

that, but here is a better way to make a permanent change to the color scheme:
> > > > > > > > > > > > >
> > > > > > > > > > > > > > 1.Use menu Options->Appearances to open the Graph Appearance window.
> > > > > > > > > > > > > 2. Change the trace colors by clicking on the Y1 or Y2 box and then selecting the desired color.
> > > > > > > > > > > > > > 3. When you have the colors you want, click Save as Preset. This lets you save the color scheme under a name that you chose. Enter the name and click Save. Your colors will now be implemented.
> > > > > > > > > > > > > 4. Use File->Save Prefs to update the preferences file to include the new color scheme in the list of Appearances, so it will still be available next time you start up.
> > > > > > > > > > > > >
> > > > > > > > > > > > > From then on, when you start up, the colors will match the newly defined Appearance. If you want to temporarily select another appearance (such as Light for printing), you can do so in the Sweep Parameters window and later switch back to your custom Appearance by just selecting its name in the Appearances list.
> > > > > > > > > > > > >
> > > > > > > > > > > > > On the other hand, if your reversal of the Dark colors was not intentional and you are OK with the default colors, you can restore them to their default values by selecting the Light Appearance and immediately selecting the Dark Appearance, which will override your custom trace color selection. You can then Save Prefs to make the change permanent.
> > > > > > > > > > > > >
> > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > >
> > > > > > > > > > > > >
> > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > Sam
> > > > > > > > > > > > > > "Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct?"
> > > > > > > > > > > > > > Yes, I have to do so to make the color correct.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > For the phase drop, that may caused by my Open calibration, where I did not extend the center pin to the plane. I can creat a OPEN cal kit to redo that.
> > > > > > > > > > > > > > Thanks
> > > > > > > > > > > > > > Lin
> > > > > > > > > > > > >
> > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > Regarding the color. Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct? That would be very odd.
> > > > > > > > > > > > >
> > > > > > > > > > > > > > Your graph looks good, but I noticed that the phase graph starts negative and steadily gets more negative. This means that on the Smith chart the graph would be a small arc rather than a single point. I'll take a shot in the dark and

guess that you calibrated with commercial standards that have the open and short implemented at the front of the connector (i.e. the calibration plane is at the front), whereas you have the 83 ohm resistor mounted on the back of a connector. That means your true DUT is the resistor at the end of a short transmission line. That transmission line (the connector) creates the non-zero phase. If my guess is correct, you can eliminate the delay by adjusting Plane Extension to move the reference plane from the front to the back of the connector.

> > > > > > > > > > > > > > > Sam W.

> > > > > > > > > > > > > > > >

> > > > > > > > > > > > > >

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8262. Re: VNA reflection mode questions for V116_4i_beta; now V116_4L_Beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-01 20:46:28 UTC
From: Sam
Topic: 8178 Message: 8262

Lin,
Your Windows settings must use an unusually large font. I can override that by specifying a particular font. I was originally under the impression that Liberty Basic used a specific default font, but it turns out LB lets Windows pick the default. So I should specify the default for each window, which I do for new windows and also for old windows when I run across the problem.

By the way, I saw your photos of your cal set. You described them as "F" connectors by which you meant female, but I took it to mean the F-style connectors used for cable TV connections. It appears to be a good quality set.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> You might want to fix the similar font size problem for:
> 1) Configureation manager
> 2) Sepcial test
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/115723472/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
>
> some other menus may also need to change the same font size for better looking.
> Thanks
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Sam
> > 116_4L_Beta fixed all the problems.
> > 1) 3G phase fixed;
> > 2) PDM menu botton font size fixed;
> > 3) Axis Clolor matchs with its curve color, fixed
> > Thanks
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > I posted new beta software with this fix. In the course of testing this, I also discovered that the previous beta had an error that could disrupt the TG. I tested at 1G and 3G; my 1G/2G band switch is at the moment de-installed.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >
> > > > You don't add that line; rather, you move another line to place it after that line:

> > > >
> > > > Locate this line:
> > > >
> > > > if FreqMode=3 then phase=0-phase
> > > >
> > > > and move it several lines down so it occurs immediately after this line:
> > > >
> > > > phase=phase-difPhase
> > > >
> > > > Sam W.
> > > >
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > >
> > > > > Sam
> > > > > I tried this line:
> > > > > > > phase=phase-difPhase
> > > > >
> > > > > For some reason, it does not work, that is why I added that fix. You may try on your MSA, in VNA transmission mode, with a cable between TG output and SA input.
> > > > > Thanks
> > > > > Lincheng Xiu
> > > > >
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > >
> > > > > >
> > > > > > It would be better just to move the line that negates phase, per my prior posting. That will also take care of the (small) adjustment that occurs due to phase calibration.
> > > > > > Sam W.
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > >
> > > > > > > Sam
> > > > > > > To fix the 3G band VNA mode phase:
> > > > > > > original: phase = phase - (180+PDMinversionDeviation)
> > > > > > > after fix:
> > > > > > > if FreqMode=3 then phase = phase + (180+PDMinversionDeviation) else phase = phase - (180+PDMinversionDeviation)
> > > > > > >
> > > > > > > I tried with above fix, 1G, 2G and 3G band phase are all correct. The code around that area with the fix should be:
> > > > > > >
> > > > > > > ....
> > > > > > > if FreqMode=3 then phase=0-phase 'For 3G mode, true phase is negative of measured phase, due to low side LO1 ver116-1b
> > > > > > > 'if PDM was inverted, subtract the inverted phase change
> > > > > > > 'The deviation in the PDM inversion from theoretical 180 deg is actually a

fixed time period
> > > > > > > 'invdeg is maintained as the actual inversion that occurs at 10.7 MHz. With a different finalfreq,
> > > > > > > 'the deviation from 180 degrees will change.
> > > > > > > if phaarray(thisstep,0)=1 then 'ver116-1b
> > > > > > > PDMinversionDeviation=(invdeg-180)*finalfreq/10.7
> > > > > > > if FreqMode=3 then phase = phase + (180+PDMinversionDeviation) else phase = phase - (180+PDMinversionDeviation)
> > > > > > > end if
> > > > > > > phase=phase-difPhase 'SEW3: subtract correction for change of phase over signal level.
> > > > > > >
> > > > > > > .....
> > > > > > >
> > > > > > > Thanks
> > > > > > > Lin
> > > > > > >
> > > > > > >
> > > > > > >
> > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > >
> > > > > > > Yes, the negation of phase in 3G should occur after the PDM inversion is applied, and after applying the phase correction from phase calibration. To fix that, locate this line:
> > > > > > >
> > > > > > > if FreqMode=3 then phase=0-phase
> > > > > > >
> > > > > > > and move it several lines down so it occurs immediately after this line:
> > > > > > >
> > > > > > > phase=phase-difPhase
> > > > > > >
> > > > > > > Hopefully, that will do the trick.
> > > > > > >
> > > > > > > Sam W.
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> > > > > > >
> > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
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> > > > > > > Sam
> > > > > > > The photo shows there are two steps during the phase inversion, the first is the original, and the second is the same as the first. I think the second is the PDM correction data, it just compensate in a wrong direction.
> > > > > > > Lin
> > > > > > >
> > > > > > > --- In spectrumanalyzer@yahoogroups.com, "swetterlin" <swetterlin@> wrote:
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> > > > > > > Everything in 3G is like looking in a mirror so it's easy to get something backwards. I'm not sure why this would not have shown up earlier though. What did

you get for your PDM inversion? If it differs from 180 by about 18 degrees or so then I would guess you are correct.
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> > > > > > > > > > > Sam
> > > > > > > > > > > 3G band PDM phase compensation might also need to inverse after we inverse the phase, otherwise, we will see this:
> > > > > > > > > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/2029992484/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > > > > > > > >
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> > > > > > > > > > >
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> > > > > > > > > > > Another point on color: each axis has a main color and two secondary colors. The secondary colors are used for reference lines, and in the Two-Port module for additional graphs on that axis. If you reverse the colors for the axes, you may want to reverse all of them. The idea was to use blues/greens for one axis and yellow/reds for the other, which makes it clearer which traces go with which axis. But, the bottom line is that the Appearances options are there so you can do it any way you want.
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> > > > > > > > > > > >
> > > > > > > > > > > > As what you said, there is a very short lengh (might be 2mm) between the cal kit plan and the test fixture plane. After I created a set of cal kits, and use the same F connector for fxiture as cal kits used, the phase not is flat.
> > > > > > > > > > > > The resistor value is not 83 ohm, it is a 82.5 ohm 1%. the calculated return loss should be: 12.21dB typical, 12.04dB min, 12.37dB max

> > > > > > > > > > > > > > What I meausred is 12.244dB, which is very close to the typical value 12.21dB.
> > > > > > > > > > > > > > Thanks
> > > > > > > > > > > > > > Lin
> > > > > > > > > > > > > >
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Here is what I think happened with the color: For the Dark Appearance, normally phase is yellow and magnitude is blue. At some point you decided to reverse those colors, so you used the Y-axis windows to select the new colors for the traces. Then you saved those settings with Save Prefs. When the preference file is loaded at startup, your custom trace colors are used for the traces themselves, but the Dark Appearance settings are used for the color of the axis labels. I will see about fixing that, but here is a better way to make a permanent change to the color scheme:
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > 1.Use menu Options->Appearances to open the Graph Appearance window.
> > > > > > > > > > > > > > > 2. Change the trace colors by clicking on the Y1 or Y2 box and then selecting the desired color.
> > > > > > > > > > > > > > > 3. When you have the colors you want, click Save as Preset. This lets you save the color scheme under a name that you chose. Enter the name and click Save. Your colors will now be implemented.
> > > > > > > > > > > > > > > 4. Use File->Save Prefs to update the preferences file to include the new color scheme in the list of Appearances, so it will still be available next time you start up.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > From then on, when you start up, the colors will match the newly defined Appearance. If you want to temporarily select another appearance (such as Light for printing), you can do so in the Sweep Parameters window and later switch back to your custom Appearance by just selecting its name in the Appearances list.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > On the other hand, if your reversal of the Dark colors was not intentional and you are OK with the default colors, you can restore them to their default values by selecting the Light Appearance and immediately selecting the Dark Appearance, which will override your custom trace color selection. You can then Save Prefs to make the change permanent.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > >
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> > > > > > > > > > > > > > > > Sam
> > > > > > > > > > > > > > > > "Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct?"
> > > > > > > > > > > > > > > > Yes, I have to do so to make the color correct.
> > > > > > > > > > > > > > > >

> > > > > > > > > > > > > > > > For the phase drop, that may caused by my Open calibration, where I did not extend the center pin to the plane. I can creat a OPEN cal kit to redo that.
> > > > > > > > > > > > > > > > Thanks
> > > > > > > > > > > > > > > > Lin
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > > > > > > > > > > > > > > > > Regarding the color. Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct? That would be very odd.
> > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > Your graph looks good, but I noticed that the phase graph starts negative and steadily gets more negative. This means that on the Smith chart the graph would be a small arc rather than a single point. I'll take a shot in the dark and guess that you calibrated with commercial standards that have the open and short implemented at the front of the connector (i.e. the calibration plane is at the front), whereas you have the 83 ohm resistor mounted on the back of a connector. That means your true DUT is the resistor at the end of a short transmission line. That transmission line (the connector) creates the non-zero phase. If my guess is correct, you can eliminate the delay by adjusting Plane Extension to move the reference plane from the front to the back of the connector.
> > > > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > > > > >
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8263. Re: VNA reflection mode questions for V116_4i_beta; now V116_4L_Beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-02 02:03:26 UTC
From: inlinebeginner
Topic: 8178 Message: 8263

Sam
I use a default setting on my windows. I can try to see if I can change that.
For "F connector" should be "SMA connector", female side, similar to thoese we used on SLIM modules, but the monting plane is a big square. I don't know how good the connector I used, looks high quality. I will upload a photo for that.
The can of the cal kits are from 75 ohm cable connector (male side). Just cut off the screw and use the rest of the metal as the round fence, and solder a end metal sheet.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Lin,
> Your Windows settings must use an unusually large font. I can override that by specifying a particular font. I was originally under the impression that Liberty Basic used a specific default font, but it turns out LB lets Windows pick the default. So I should specify the default for each window, which I do for new windows and also for old windows when I run across the problem.
>
> By the way, I saw your photos of your cal set. You described them as "F" connectors by which you meant female, but I took it to mean the F-style connectors used for cable TV connections. It appears to be a good quality set.
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Sam
> > You might want to fix the similar font size problem for:
> > 1) Configureation manager
> > 2) Sepcial test
> > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/115723472/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> >
> > some other menus may also need to change the same font size for better looking.
> > Thanks
> >
> > --- In spectrumanalyzer@...m, "inlinebeginner" <inlinebeginner@> wrote:
> > >
> > > Sam
> > > 116_4L_Beta fixed all the problems.
> > > 1) 3G phase fixed;
> > > 2) PDM menu botton font size fixed;
> > > 3) Axis Clolor matchs with its curve color, fixed
> > > Thanks
> > > Lin

> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >
> > > > I posted new beta software with this fix. In the course of testing this, I also discovered that the previous beta had an error that could disrupt the TG. I tested at 1G and 3G; my 1G/2G band switch is at the moment de-installed.
> > > >
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > >
> > > > > You don't add that line; rather, you move another line to place it after that line:
> > > > >
> > > > > Locate this line:
> > > > >
> > > > > if FreqMode=3 then phase=0-phase
> > > > >
> > > > > and move it several lines down so it occurs immediately after this line:
> > > > >
> > > > > phase=phase-difPhase
> > > > >
> > > > > Sam W.
> > > > >
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > >
> > > > > > Sam
> > > > > > I tried this line:
> > > > > > > > phase=phase-difPhase
> > > > > >
> > > > > > For some reason, it does not work, that is why I added that fix. You may try on your MSA, in VNA transmission mode, with a cable between TG output and SA input.
> > > > > > Thanks
> > > > > > Lincheng Xiu
> > > > > >
> > > > > >
> > > > > > --- In spectrumanalyzer@...m, "Sam" <swetterlin@> wrote:
> > > > > > >
> > > > > > >
> > > > > > > It would be better just to move the line that negates phase, per my prior posting. That will also take care of the (small) adjustment that occurs due to phase calibration.
> > > > > > Sam W.
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > >
> > > > > > > Sam

> > > > > > > > To fix the 3G band VNA mode phase:
> > > > > > > > original: phase = phase - (180+PDMinversionDeviation)
> > > > > > > > after fix:
> > > > > > > > if FreqMode=3 then phase = phase + (180+PDMinversionDeviation) else phase = phase - (180+PDMinversionDeviation)
> > > > > > > >
> > > > > > > > I tried with above fix, 1G, 2G and 3G band phase are all correct. The code around that area with the fix should be:
> > > > > > > >
> > > > > > > > ....
> > > > > > > > if FreqMode=3 then phase=0-phase 'For 3G mode, true phase is negative of measured phase, due to low side LO1 ver116-1b
> > > > > > > > 'if PDM was inverted, subtract the inverted phase change
> > > > > > > > 'The deviation in the PDM inversion from theoretical 180 deg is actually a fixed time period
> > > > > > > > 'invdeg is maintained as the actual inversion that occurs at 10.7 MHz. With a different finalfreq,
> > > > > > > > 'the deviation from 180 degrees will change.
> > > > > > > > if phaarray(thisstep,0)=1 then 'ver116-1b
> > > > > > > > PDMinversionDeviation=(invdeg-180)*finalfreq/10.7
> > > > > > > > if FreqMode=3 then phase = phase + (180+PDMinversionDeviation) else phase = phase - (180+PDMinversionDeviation)
> > > > > > > > end if
> > > > > > > > phase=phase-difPhase 'SEW3: subtract correction for change of phase over signal level.
> > > > > > > >
> > > > > > > > .....
> > > > > > > >
> > > > > > > > Thanks
> > > > > > > > Lin
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> > > > > > > > phase=phase-difPhase
> > > > > > > >
> > > > > > > > Hopefully, that will do the trick.
> > > > > > > >
> > > > > > > > Sam W.
> > > > > > > >
> > > > > > > >

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> > > > > > > > > > > > >
> > > > > > > > > > > > > > 1.Use menu Options->Appearances to open the Graph Appearance window.
> > > > > > > > > > > > > > 2. Change the trace colors by clicking on the Y1 or Y2 box and then selecting the desired color.
> > > > > > > > > > > > > > 3. When you have the colors you want, click Save as Preset. This lets you save the color scheme under a name that you chose. Enter the name and click Save. Your colors will now be implemented.
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> > > > > > > > > > > > > > > > > > Your graph looks good, but I noticed that the phase graph starts negative and steadily gets more negative. This means that on the Smith chart the graph would be a small arc rather than a single point. I'll take a shot in the dark and guess that you calibrated with commercial standards that have the open and short implemented at the front of the connector (i.e. the calibration plane is at the front), whereas you have the 83 ohm resistor mounted on the back of a connector. That means your true DUT is the resistor at the end of a short transmission line. That transmission line (the connector) creates the non-zero phase. If my guess is correct, you can eliminate the delay by adjusting Plane Extension to move the reference plane from the front to the back of the connector.
> > > > > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > > > > >
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8264. Re: VNA reflection mode questions for V116_4i_beta; now V116_4L_Beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-02 13:30:14 UTC
From: Sam
Topic: 8178 Message: 8264

Lin,
Actually, it is probably a good thing that you have a large font. It flushes out possible problems that would not otherwise be apparent.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> I use a default setting on my windows. I can try to see if I can change that.
> For "F connector" should be "SMA connector", female side, similar to thoese we used on SLIM modules, but the monting plane is a big square. I don't know how good the connector I used, looks high quality. I will upload a photo for that.
> The can of the cal kits are from 75 ohm cable connector (male side). Just cut off the screw and use the rest of the metal as the round fence, and solder a end metal sheet.
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Lin,
> > Your Windows settings must use an unusually large font. I can override that by specifying a particular font. I was originally under the impression that Liberty Basic used a specific default font, but it turns out LB lets Windows pick the default. So I should specify the default for each window, which I do for new windows and also for old windows when I run across the problem.
> >
> > By the way, I saw your photos of your cal set. You described them as "F" connectors by which you meant female, but I took it to mean the F-style connectors used for cable TV connections. It appears to be a good quality set.
> > Sam W.
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> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
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> > > Sam
> > > You might want to fix the similar font size problem for:
> > > 1) Configureation manager
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> > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/115723472/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > >
> > > some other menus may also need to change the same font size for better looking.
> > > Thanks
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> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > >

> > > > Sam
> > > > 116_4L_Beta fixed all the problems.
> > > > 1) 3G phase fixed;
> > > > 2) PDM menu botton font size fixed;
> > > > 3) Axis Clolor matchs with its curve color, fixed
> > > > Thanks
> > > > Lin
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > >
> > > > > I posted new beta software with this fix. In the course of testing this, I also discovered that the previous beta had an error that could disrupt the TG. I tested at 1G and 3G; my 1G/2G band switch is at the moment de-installed.
> > > > >
> > > > > Sam W.
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > >
> > > > > > You don't add that line; rather, you move another line to place it after that line:
> > > > > >
> > > > > > Locate this line:
> > > > > >
> > > > > > if FreqMode=3 then phase=0-phase
> > > > > >
> > > > > > and move it several lines down so it occurs immediately after this line:
> > > > > >
> > > > > > phase=phase-difPhase
> > > > > >
> > > > > > Sam W.
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> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
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> > > > > > > Sam
> > > > > > > I tried this line:
> > > > > > > > phase=phase-difPhase
> > > > > > >
> > > > > > > For some reason, it does not work, that is why I added that fix. You may try on your MSA, in VNA transmission mode, with a cable between TG output and SA input.
> > > > > > > Thanks
> > > > > > > Lincheng Xiu
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> > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > > > > > > It would be better just to move the line that negates phase, per my prior posting. That will also take care of the (small) adjustment that occurs due to phase

calibration.
> > > > > > > > Sam W.
> > > > > > > >
> > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@>
wrote:
> > > > > > > >
> > > > > > > > > Sam
> > > > > > > > > To fix the 3G band VNA mode phase:
> > > > > > > > > original: phase = phase - (180+PDMinversionDeviation)
> > > > > > > > > after fix:
> > > > > > > > > if FreqMode=3 then phase = phase + (180+PDMinversionDeviation) else phase
= phase - (180+PDMinversionDeviation)
> > > > > > > >
> > > > > > > > > I tried with above fix, 1G, 2G and 3G band phase are all correct. The
code around that area with the fix should be:
> > > > > > > >
> > > > > > > > > ....
> > > > > > > > > if FreqMode=3 then phase=0-phase 'For 3G mode, true phase is negative of
measured phase, due to low side LO1 ver116-1b
> > > > > > > > > 'if PDM was inverted, subtract the inverted phase change
> > > > > > > > > 'The deviation in the PDM inversion from theoretical 180 deg is actually
a fixed time period
> > > > > > > > > 'invdeg is maintained as the actual inversion that occurs at 10.7 MHz.
With a different finalfreq,
> > > > > > > > > 'the deviation from 180 degrees will change.
> > > > > > > > > if phaarray(thisstep,0)=1 then 'ver116-1b
> > > > > > > > > PDMinversionDeviation=(invdeg-180)*finalfreq/10.7
> > > > > > > > > if FreqMode=3 then phase = phase + (180+PDMinversionDeviation) else phase
= phase - (180+PDMinversionDeviation)
> > > > > > > > > end if
> > > > > > > > > phase=phase-difPhase 'SEW3: subtract correction for change of phase over
signal level.
> > > > > > > >
> > > > > > > > > .....
> > > > > > > >
> > > > > > > > > Thanks
> > > > > > > > > Lin
> > > > > > > >
> > > > > > > >
> > > > > > > >
> > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > >
> > > > > > > > > Yes, the negation of phase in 3G should occur after the PDM inversion
is applied, and after applying the phase correction from phase calibration. To fix that,
locate this line:
> > > > > > > >
> > > > > > > > > if FreqMode=3 then phase=0-phase
> > > > > > > >
> > > > > > > > > and move it several lines down so it occurs immediately after this
line:
> > > > > > > >

> > > > > > > > > > phase=phase-difPhase
> > > > > > > > > > >
> > > > > > > > > > > Hopefully, that will do the trick.
> > > > > > > > > > >
> > > > > > > > > > > Sam W.
> > > > > > > > > > >
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner"
<inlinebeginner@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > Sam
> > > > > > > > > > > The photo shows there are two steps during the phase inversion, the first is the original, and the second is the same as the first. I think the second is the PDM correction data, it just compensate in a wrong direction.
> > > > > > > > > > > Lin
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "swetterlin" <swetterlin@>
wrote:
> > > > > > > > > > >
> > > > > > > > > > > Lin,
> > > > > > > > > > > Everything in 3G is like looking in a mirror so it's easy to get something backwards. I'm not sure why this would not have shown up earlier though. What did you get for your PDM inversion? If it differs from 180 by about 18 degrees or so then I would guess you are correct.
> > > > > > > > > > > Sam W.
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner"
<inlinebeginner@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > Sam
> > > > > > > > > > > 3G band PDM phase compensation might also need to inverse after we inverse the phase, otherwise, we will see this:
> > > > > > > > > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/2029992484/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > > > > > > > >
> > > > > > > > > > > Thanks
> > > > > > > > > > > Lin
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "swetterlin"
<swetterlin@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > Those results are excellent. Magnitude is right on, and phase is reasonably close to zero. At 1 GHz, 1 mm in a connector is about 1.75 degrees of phase delay, and for the round-trip represented by reflection it is double that. So it is hard to get picky about phase measurements at such frequencies unless you are confident all connectors--the ones used for calibration and the ones used for DUTs--are all exactly the same length with exactly the same electrical characteristics. I don't think quality is on the top of the manufacturer's mind for F connectors. But yours are giving good results.
> > > > > > > > > > >
> > > > > > > > > > > Another point on color: each axis has a main color and two

secondary colors. The secondary colors are used for reference lines, and in the Two-Port module for additional graphs on that axis. If you reverse the colors for the axes, you may want to reverse all of them. The idea was to use blues/greens for one axis and yellow/reds for the other, which makes it clearer which traces go with which axis. But, the bottom line is that the Appearances options are there so you can do it any way you want.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Sam
> > > > > > > > > > > > > > > I will try what you said for the color.
> > > > > > > > > > > > > > > For the 83 ohm phase tilt, I corrected today, the figures are here:
> > > > > > > > > > > > > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/949537787/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > As what you said, there is a very short lengh (might be 2mm) between the cal kit plan and the test fixture plane. After I created a set of cal kits, and use the same F connector for fxiture as cal kits used, the phase not is flat.
> > > > > > > > > > > > > > > The resistor value is not 83 ohm, it is a 82.5 ohm 1%. the calculated return loss should be: 12.21dB typical, 12.04dB min, 12.37dB max
> > > > > > > > > > > > > > > What I meausred is 12.244dB, which is very close to the typical value 12.21dB.
> > > > > > > > > > > > > > > Thanks
> > > > > > > > > > > > > > > Lin
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Here is what I think happened with the color: For the Dark Appearance, normally phase is yellow and magnitude is blue. At some point you decided to reverse those colors, so you used the Y-axis windows to select the new colors for the traces. Then you saved those settings with Save Prefs. When the preference file is loaded at startup, your custom trace colors are used for the traces themselves, but the Dark Appearance settings are used for the color of the axis labels. I will see about fixing that, but here is a better way to make a permanent change to the color scheme:
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > 1.Use menu Options->Appearances to open the Graph Appearance window.
> > > > > > > > > > > > > > > 2. Change the trace colors by clicking on the Y1 or Y2 box and then selecting the desired color.
> > > > > > > > > > > > > > > 3. When you have the colors you want, click Save as Preset. This lets you save the color scheme under a name that you chose. Enter the name and click Save. Your colors will now be implemented.
> > > > > > > > > > > > > > > 4. Use File->Save Prefs to update the preferences file to include the new color scheme in the list of Appearances, so it will still be available next time you start up.
> > > > > > > > > > > > > > >

> > > > > > > > > > > > > > > > > From then on, when you start up, the colors will match the newly defined Appearance. If you want to temporarily select another appearance (such as Light for printing), you can do so in the Sweep Parameters window and later switch back to your custom Appearance by just selecting its name in the Appearances list.
> > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > On the other hand, if your reversal of the Dark colors was not intentional and you are OK with the default colors, you can restore them to their default values by selecting the Light Appearance and immediately selecting the Dark Appearance, which will override your custom trace color selection. You can then Save Prefs to make the change permanent.
> > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > > > > >
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> > > > > > > > > > > > > > > > > > Sam
> > > > > > > > > > > > > > > > > > "Do you mean that when you start up the colors are reversed, but when you open and then close the Y-axis preferences window, the colors are correct?"
> > > > > > > > > > > > > > > > > > Yes, I have to do so to make the color correct.
> > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > For the phase drop, that may caused by my Open calibration, where I did not extend the center pin to the plane. I can creat a OPEN cal kit to redo that.
> > > > > > > > > > > > > > > > > > Thanks
> > > > > > > > > > > > > > > > > > Lin
> > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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8265. Re: [spectrumanalyzer] Re: VNA reflection mode questions for V116_4i_beta; now V116_4L_Beta

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-02 14:01:04 UTC
From: Jim Hontoria
Topic: 8178 Message: 8265

Sam,
I believe that when the program starts and shows the zero response, the span is supposed to be 10 times the bandwidth of the RBW filter. The software is not doing that: it opens with the same bandwidth as the filter.
Also if you switch filters the zero response bandwidth remains constant.

Jim W1JGH.
On Sat, Jul 2, 2011 at 9:30 AM, Sam <swetterlin@...> wrote:

> **
>
>
> Lin,
> Actually, it is probably a good thing that you have a large font. It
> flushes out possible problems that would not otherwise be apparent.
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> Windows pick the default. So I should specify the default for each window,
> which I do for new windows and also for old windows when I run across the
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> > > By the way, I saw your photos of your cal set. You described them as

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> > > > > > > You don't add that line; rather, you move another line to place
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> > > > > > > if FreqMode=3 then phase=0-phase
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> correct. The code around that area with the fix should be:
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> > > > > > > if FreqMode=3 then phase=0-phase 'For 3G mode, true phase
> is negative of measured phase, due to low side LO1 ver116-1b
> > > > > > > 'if PDM was inverted, subtract the inverted phase change

> > > > > > > > > > 'The deviation in the PDM inversion from theoretical 180
> deg is actually a fixed time period
> > > > > > > > > > 'invdeg is maintained as the actual inversion that occurs
> at 10.7 MHz. With a different finalfreq,
> > > > > > > > > > 'the deviation from 180 degrees will change.
> > > > > > > > > > if phaarray(thisstep,0)=1 then 'ver116-1b
> > > > > > > > > > PDMinversionDeviation=(invdeg-180)*finalfreq/10.7
> > > > > > > > > > if FreqMode=3 then phase = phase +
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> > > > > > > > > > end if
> > > > > > > > > > phase=phase-difPhase 'SEW3: subtract correction for
> change of phase over signal level.
> > > > > > > > > >
> > > > > > > > > > .....
> > > > > > > > > >
> > > > > > > > > > Thanks
> > > > > > > > > > Lin
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam"
> <swetterlin@> wrote:
> > > > > > > > > >
> > > > > > > > > > Yes, the negation of phase in 3G should occur after the
> PDM inversion is applied, and after applying the phase correction from phase
> calibration. To fix that, locate this line:
> > > > > > > > > >
> > > > > > > > > > if FreqMode=3 then phase=0-phase
> > > > > > > > > >
> > > > > > > > > > and move it several lines down so it occurs immediately
> after this line:
> > > > > > > > > >
> > > > > > > > > > phase=phase-difPhase
> > > > > > > > > >
> > > > > > > > > > Hopefully, that will do the trick.
> > > > > > > > > >
> > > > > > > > > > Sam W.
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > > --- In spectrumanalyzer@...m,
> "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > > > >
> > > > > > > > > > Sam
> > > > > > > > > > The photo shows there are two steps during the phase
> inversion, the first is the original, and the second is the same as the
> first. I think the second is the PDM correction data, it just compensate in
> a wrong direction.
> > > > > > > > > > Lin
> > > > > > > > > >
> > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com,

> "swetterlin" <swetterlin@> wrote:
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > Lin,
> > > > > > > > > > > > > > Everything in 3G is like looking in a mirror so
> it's easy to get something backwards. I'm not sure why this would not have
> shown up earlier though. What did you get for your PDM inversion? If it
> differs from 180 by about 18 degrees or so then I would guess you are
> correct.
> > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com,
> "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > Sam
> > > > > > > > > > > > > > 3G band PDM phase compensation might also need to
> inverse after we inverse the phase, otherwise, we will see this:
> > > > > > > > > > > > > >
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/2029992484/vie
w?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > Thanks
> > > > > > > > > > > > > > Lin
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com,
> "swetterlin" <swetterlin@> wrote:
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > Those results are excellent. Magnitude is right
> on, and phase is reasonably close to zero. At 1 GHz, 1 mm in a connector is
> about 1.75 degrees of phase delay, and for the round-trip represented by
> reflection it is double that. So it is hard to get picky about phase
> measurements at such frequencies unless you are confident all
> connectors--the ones used for calibration and the ones used for DUTs--are
> all exactly the same length with exactly the same electrical
> characteristics. I don't think quality is on the top of the manufacturer's
> mind for F connectors. But yours are giving good results.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > Another point on color: each axis has a main
> color and two secondary colors. The secondary colors are used for reference
> lines, and in the Two-Port module for additional graphs on that axis. If you
> reverse the colors for the axes, you may want to reverse all of them. The
> idea was to use blues/greens for one axis and yellow/reds for the other,
> which makes it clearer which traces go with which axis. But, the bottom line
> is that the Appearances options are there so you can do it any way you want.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com,
> "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > Sam

> > > > > > > > > > > > > > > > > I will try what you said for the color.
> > > > > > > > > > > > > > > > > For the 83 ohm phase tilt, I corrected today,
> the figures are here:
> > > > > > > > > > > > > > > >
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/949537787/view
?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > As what you said, there is a very short lengh
> (might be 2mm) between the cal kit plan and the test fixture plane. After I
> created a set of cal kits, and use the same F connector for fxiture as cal
> kits used, the phase not is flat.
> > > > > > > > > > > > > > > > The resistor value is not 83 ohm, it is a
> 82.5 ohm 1%. the calculated return loss should be: 12.21dB typical, 12.04dB
> min, 12.37dB max
> > > > > > > > > > > > > > > > What I meausred is 12.244dB, which is very
> close to the typical value 12.21dB.
> > > > > > > > > > > > > > > > Thanks
> > > > > > > > > > > > > > > > Lin
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com,
> "Sam" <swetterlin@> wrote:
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > Here is what I think happened with the
> color: For the Dark Appearance, normally phase is yellow and magnitude is
> blue. At some point you decided to reverse those colors, so you used the
> Y-axis windows to select the new colors for the traces. Then you saved those
> settings with Save Prefs. When the preference file is loaded at startup,
> your custom trace colors are used for the traces themselves, but the Dark
> Appearance settings are used for the color of the axis labels. I will see
> about fixing that, but here is a better way to make a permanent change to
> the color scheme:
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > 1.Use menu Options->Appearances to open the
> Graph Appearance window.
> > > > > > > > > > > > > > > > 2. Change the trace colors by clicking on
> the Y1 or Y2 box and then selecting the desired color.
> > > > > > > > > > > > > > > > 3. When you have the colors you want, click
> Save as Preset. This lets you save the color scheme under a name that you
> chose. Enter the name and click Save. Your colors will now be implemented.
> > > > > > > > > > > > > > > > 4. Use File->Save Prefs to update the
> preferences file to include the new color scheme in the list of Appearances,
> so it will still be available next time you start up.
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > From then on, when you start up, the colors
> will match the newly defined Appearance. If you want to temporarily select
> another appearance (such as Light for printing), you can do so in the Sweep
> Parameters window and later switch back to your custom Appearance by just
> selecting its name in the Appearances list.
> > > > > > > > > > > > > > > >

> > > > > > > > > > > > > > > > > > On the other hand, if your reversal of the
> Dark colors was not intentional and you are OK with the default colors, you
> can restore them to their default values by selecting the Light Appearance
> and immediately selecting the Dark Appearance, which will override your
> custom trace color selection. You can then Save Prefs to make the change
> permanent.
> > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com,
> "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > Sam
> > > > > > > > > > > > > > > > > > "Do you mean that when you start up the
> colors are reversed, but when you open and then close the Y-axis preferences
> window, the colors are correct?"
> > > > > > > > > > > > > > > > > > Yes, I have to do so to make the color
> correct.
> > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > For the phase drop, that may caused by my
> Open calibration, where I did not extend the center pin to the plane. I can
> creat a OPEN cal kit to redo that.
> > > > > > > > > > > > > > > > > > Thanks
> > > > > > > > > > > > > > > > > > Lin
> > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com,
> "Sam" <swetterlin@> wrote:
> > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > Regarding the color. Do you mean that
> when you start up the colors are reversed, but when you open and then close
> the Y-axis preferences window, the colors are correct? That would be very
> odd.
> > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > Your graph looks good, but I noticed
> that the phase graph starts negative and steadily gets more negative. This
> means that on the Smith chart the graph would be a small arc rather than a
> single point. I'll take a shot in the dark and guess that you calibrated
> with commercial standards that have the open and short implemented at the
> front of the connector (i.e. the calibration plane is at the front), whereas
> you have the 83 ohm resistor mounted on the back of a connector. That means
> your true DUT is the resistor at the end of a short transmission line. That
> transmission line (the connector) creates the non-zero phase. If my guess is
> correct, you can eliminate the delay by adjusting Plane Extension to move
> the reference plane from the front to the back of the connector.
> > > > > > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > >
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--
Jim G. Hontoria

8266. Startup sweep range.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-02 17:07:40 UTC
From: Sam
Topic: 8178 Message: 8266

Jim,
The program starts up with whatever sweep range is in the preferences file, prefs.txt. The very first time it starts, there is no such file so it starts with a zero center and a span equal to 10 times the RBW. It then creates the preferences file with that data. If you re-save the prefs.txt file with different values, those become your startup values. The sweep range is never changed simply by changing RBW filters.

Also, I have noticed a tendency of people to post messages by replying to any-old-random message that has already been posted. That creates meaningless subject lines, very long threads and a whole lot of clutter attached to the end of the new message. It is much better to create a new thread.

Sam W.

8267. Web Page Editor

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-03 12:57:29 UTC
From: william
Topic: 8267 Message: 8267

Hi All,
A quick question. I have been using Netscape Composer as my web page editor, using the wysiwyg style. I need a new editor for my XP computer and I am using Firefox as my browser. Can someone suggest a comparable editor (free, or course).
Scotty

8268. Re: Web Page Editor

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-03 14:30:16 UTC
From: Sam
Topic: 8267 Message: 8268

I'm at even a more primitive level. I use MS Word and then save the document as html. That's why my web site is very bare bones--basically a list of downloadable documents.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "william" <wsprowls@...> wrote:
>
> Hi All,
> A quick question. I have been using Netscape Composer as my web page editor, using the wysiwyg style. I need a new editor for my XP computer and I am using Firefox as my browser. Can someone suggest a comparable editor (free, or course).
> Scotty
>

8269. Re: Web Page Editor

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-03 15:32:40 UTC
From: Greg Broburg
Topic: 8267 Message: 8269

Hi Sam;

Agreed, you can do a lot with a text editor, I use Note Tab Pro, it seems to work pretty well.

Greg

On 7/3/2011 9:30 AM, Sam wrote:
>
> I'm at even a more primitive level. I use MS Word and then save the
> document as html. That's why my web site is very bare bones--basically
> a list of downloadable documents.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "william" <wsprowls@...>
> wrote:
> >
> > Hi All,
> > A quick question. I have been using Netscape Composer as my web page
> editor, using the wysiwyg style. I need a new editor for my XP
> computer and I am using Firefox as my browser. Can someone suggest a
> comparable editor (free, or course).
> > Scotty
> >
>
>

8270. Re: Web Page Editor

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-03 15:34:22 UTC
From: n6tdt
Topic: 8267 Message: 8270

Scotty

You might want to look at this page and then pick one that you like

http://www.godandscience.org/general/free_wsyiwyg_html_editors.html

SeaMonkey seems to be a re-run of Netscape page editor.

Dan Ellis
N6TDT

--- In spectrumanalyzer@yahoogroups.com, "william" <wsprowls@...> wrote:
>
> Hi All,
> A quick question. I have been using Netscape Composer as my web page editor, using the wysiwyg style. I need a new editor for my XP computer and I am using Firefox as my browser. Can someone suggest a comparable editor (free, or course).
> Scotty
>

8271. Re: Web Page Editor

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-03 16:32:46 UTC
From: dvcamvideo2004
Topic: 8267 Message: 8271

Scotty,

You might look at Wordpress, it was designed for blogs but does a good job with html too.
http://www.wordpress.com

Bob
wb6kwt

--- In spectrumanalyzer@yahoogroups.com, "william" <wsprowls@...> wrote:
>
> Hi All,
> A quick question. I have been using Netscape Composer as my web page editor, using the wysiwyg style. I need a new editor for my XP computer and I am using Firefox as my browser. Can someone suggest a comparable editor (free, or course).
> Scotty
>

8272. Re: [spectrumanalyzer] Web Page Editor

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-03 17:33:23 UTC
From: William Dillon
Topic: 8267 Message: 8272

Another great thing about wordpress is that you can delegate pages to different authors. That way, Sam could write directly on many pages, and if you wanted me to make some construction instructions (like I did on my blog: http://alternet.us.com/?page_id=751) I could be given permissions for only that page.

Also, it's more work, and I don't know how to do it exactly, but Drupal is generic enough that I think it could completely replace the capabilities of the Yahoo Groups page if Yahoo decides to kill it. The only part I don't know about is the mailing list, but that's the most likely thing for Yahoo to keep.

- Will

On Jul 3, 2011, at 9:32 AM, dvcamvideo2004 wrote:

> Scotty,
>
> You might look at Wordpress, it was designed for blogs but does a good job with html too. http://www.wordpress.com
>
> Bob
> wb6kwt
>
> --- In spectrumanalyzer@yahoogroups.com, "william" <wsprowls@...> wrote:
> >
> > Hi All,
> > A quick question. I have been using Netscape Composer as my web page editor, using the wysiwyg style. I need a new editor for my XP computer and I am using Firefox as my browser. Can someone suggest a comparable editor (free, or course).
> > Scotty
> >
>
>

8273. Re: Web Page Editor

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-03 20:47:58 UTC
From: Sam
Topic: 8267 Message: 8273

I just took a quick look at the Wordpress site, and it appears to me that it is geared toward formatting things hosted on their web site. Is that correct?
Sam W.

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> Another great thing about wordpress is that you can delegate pages to different authors. That way, Sam could write directly on many pages, and if you wanted me to make some construction instructions (like I did on my blog: http://alternet.us.com/?page_id=751) I could be given permissions for only that page.
>
> Also, it's more work, and I don't know how to do it exactly, but Drupal is generic enough that I think it could completely replace the capabilities of the Yahoo Groups page if Yahoo decides to kill it. The only part I don't know about is the mailing list, but that's the most likely thing for Yahoo to keep.
>
> - Will
>
> On Jul 3, 2011, at 9:32 AM, dvcamvideo2004 wrote:
>
> > Scotty,
> >
> > You might look at Wordpress, it was designed for blogs but does a good job with html too. http://www.wordpress.com
> >
> > Bob
> > wb6kwt
> >
> > --- In spectrumanalyzer@yahoogroups.com, "william" <wsprowls@> wrote:
> > >
> > > Hi All,
> > > A quick question. I have been using Netscape Composer as my web page editor, using the wysiwyg style. I need a new editor for my XP computer and I am using Firefox as my browser. Can someone suggest a comparable editor (free, or course).
> > > Scotty
> > >
> >
> >
>

8274. Re: [spectrumanalyzer] Web Page Editor

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-03 21:14:41 UTC
From: William Dillon
Topic: 8267 Message: 8274

There's 2 different ways to do wordpress.

there's wordpress.com and wordpress.org. the .com site hosts blogs for people. The .org site is geared toward the open source project concerned only with the software. On my blog, I pay for hosting at dreamhost and use wordpress to run the blog. I don't host anything on wordpress.com.

On Jul 3, 2011, at 1:47 PM, Sam wrote:

> I just took a quick look at the Wordpress site, and it appears to me that it is geared toward formatting things hosted on their web site. Is that correct?
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
> >
> > Another great thing about wordpress is that you can delegate pages to different authors. That way, Sam could write directly on many pages, and if you wanted me to make some construction instructions (like I did on my blog: http://alternet.us.com/?page_id=751) I could be given permissions for only that page.
> >
> > Also, it's more work, and I don't know how to do it exactly, but Drupal is generic enough that I think it could completely replace the capabilities of the Yahoo Groups page if Yahoo decides to kill it. The only part I don't know about is the mailing list, but that's the most likely thing for Yahoo to keep.
> >
> > - Will
> >
> > On Jul 3, 2011, at 9:32 AM, dvcamvideo2004 wrote:
> >
> > > Scotty,
> > >
> > > You might look at Wordpress, it was designed for blogs but does a good job with html too. http://www.wordpress.com
> > >
> > > Bob
> > > wb6kwt
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "william" <wsprowls@> wrote:
> > > >
> > > > Hi All,
> > > > A quick question. I have been using Netscape Composer as my web page editor, using the wysiwyg style. I need a new editor for my XP computer and I am using Firefox as my browser. Can someone suggest a comparable editor (free, or course).
> > > > Scotty
> > > >
> > >

> > >
> >
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>

8275. T-Check

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-04 16:48:10 UTC
From: Sam
Topic: 8275 Message: 8275

Rohde & Schwarz has software to calculate a "T-Check" figure of merit for VNAs, based on reflection and transmission scans of a tee whose third branch is terminated in 50 ohms. A result of 100% is ideal and anything within 10% of that is considered very good; 15% deviation is acceptable. On commercial VNAs, this test would be performed after first doing full 10- or 12-term calibration. My objective is to achieve good results without the extra fuss, using normal OSL calibration for reflection and Through calibration for transmission, relying on attenuators to create a good source and load match. I put 7.7 dB on the TG output and 14 dB on the MSA input. I posted a photo of the results:

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/252922278/pic/85655545/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

Up to 200 MHz, the deviation was only about 1%; it gradually deteriorated but exceeded 10% (the green area in the photo) only just before reaching 1 GHz. I have reason to suspect the quality of the tee I used, which may have affected the high frequency performance.

The attenuators of course reduce the dynamic range unless you counter them with an amplifier, but the range is still good without an amp. I believe that up to a few hundred MHz, the attenuation could be cut in half and still achieve excellent results.

(Note the percentage deviations do not translate directly to percentage accuracy; they are simply the deviation from a perfect figure of merit.)

Sam W.

8276. Re: [spectrumanalyzer] T-Check

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-04 18:27:26 UTC
From: Geoff Moore
Topic: 8275 Message: 8276

Found the application note but can't locate the software. Can you give us a clue.

Geoff

----- Original Message -----
From: "Sam" <swetterlin@...>
To: <spectrumanalyzer@yahoogroups.com>
Sent: Monday, July 04, 2011 5:48 PM
Subject: [spectrumanalyzer] T-Check

Rohde & Schwarz has software to calculate a "T-Check" figure of merit for VNAs, based on reflection and transmission scans of a tee whose third branch is terminated in 50 ohms. A result of 100% is ideal and anything within 10% of that is considered very good; 15% deviation is acceptable. On commercial VNAs, this test would be performed after first doing full 10- or 12-term calibration. My objective is to achieve good results without the extra fuss, using normal OSL calibration for reflection and Through calibration for transmission, relying on attenuators to create a good source and load match. I put 7.7 dB on the TG output and 14 dB on the MSA input. I posted a photo of the results:

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/252922278/pic/85655545/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

Up to 200 MHz, the deviation was only about 1%; it gradually deteriorated but exceeded 10% (the green area in the photo) only just before reaching 1 GHz. I have reason to suspect the quality of the tee I used, which may have affected the high frequency performance.

The attenuators of course reduce the dynamic range unless you counter them with an amplifier, but the range is still good without an amp. I believe that up to a few hundred MHz, the attenuation could be cut in half and still achieve excellent results.

(Note the percentage deviations do not translate directly to percentage accuracy; they are simply the deviation from a perfect figure of merit.)

Sam W.

8277. Re: T-Check

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-04 19:51:18 UTC
From: Sam
Topic: 8275 Message: 8277

It's now in the Files section under T-Check_HD_Install. To create the file to analyze, do reflection and transmission scans of the tee (after proper calibration), then open the Two-Port window and tell it to transfer Transmission to S21 and S12 and Reflection to S11 and S22. Note that due to the symmetry of the tee, you can re-use the forward scan data for the reverse data. Then save the file.

The T-Check software has a bug in that the Touchstone file data has to be in Hz. Therefore, you have to change the header line (beginning with "#") to Hz, and change the frequency data to Hz. I did the latter by opening the file in Notepad, copying all the data to Excel, using Text to Columns to get it entered properly, creating a new second column calculated to be 1000000 times the first column, copying everything except column 1 and pasting it back into Notepad and saving the file. In the process the first data line got messed up so I fixed it manually.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Geoff Moore" <m0ore@...> wrote:
>
> Found the application note but can't locate the software. Can you give us a
> clue.
>
> Geoff
>
> ----- Original Message -----
> From: "Sam" <swetterlin@...>
> To: <spectrumanalyzer@yahoogroups.com>
> Sent: Monday, July 04, 2011 5:48 PM
> Subject: [spectrumanalyzer] T-Check
>
>
> Rohde & Schwarz has software to calculate a "T-Check" figure of merit for
> VNAs, based on reflection and transmission scans of a tee whose third branch
> is terminated in 50 ohms. A result of 100% is ideal and anything within 10%
> of that is considered very good; 15% deviation is acceptable. On commercial
> VNAs, this test would be performed after first doing full 10- or 12-term
> calibration. My objective is to achieve good results without the extra fuss,
> using normal OSL calibration for reflection and Through calibration for
> transmission, relying on attenuators to create a good source and load match.
> I put 7.7 dB on the TG output and 14 dB on the MSA input. I posted a photo
> of the results:
>
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/252922278/pic/85655545/view?
picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc
>
> Up to 200 MHz, the deviation was only about 1%; it gradually deteriorated
> but exceeded 10% (the green area in the photo) only just before reaching 1

> GHz. I have reason to suspect the quality of the tee I used, which may have
> affected the high frequency performance.
>
> The attenuators of course reduce the dynamic range unless you counter them
> with an amplifier, but the range is still good without an amp. I believe
> that up to a few hundred MHz, the attenuation could be cut in half and still
> achieve excellent results.
>
> (Note the percentage deviations do not translate directly to percentage
> accuracy; they are simply the deviation from a perfect figure of merit.)
>
> Sam W.
>

8278. Re: T-Check

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-05 14:04:13 UTC
From: Sam
Topic: 8275 Message: 8278

Well, the third arm fell off my tee while I was messing with it, so it was indeed defective. Here is a T-Check with another tee:

<http://groups.yahoo.com/group/spectrumanalyzer/photos/album/252922278/pic/942936460/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>

This was actually a tiny bit worse at low frequency, but still very good, and it even improved at high frequency. Ranged from 0-5% deviation, with max of 10% being the goal.

If you do this test, it is best to put the target .s2p file freestanding on the C: drive; it is a bit awkward to navigate to a file in the T-Check software. (I think this software dates from pre-Windows 98.)

The actual meaning of the T-Check results is a bit obscure if you try to make it into something other than a pass/fail test. As I mentioned, it is not directly a measure of percentage accuracy. In terms of actual accuracy, S11 should ideally have been -9.54 dB and was very close to -9.65 dB all the way to 1 GHz. S21 should have been -3.52 dB and varied from -3.54 dB at 1 MHz to -3.46 dB at 1 GHz.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> It's now in the Files section under T-Check_HD_Install. To create the file to analyze, do reflection and transmission scans of the tee (after proper calibration), then open the Two-Port window and tell it to transfer Transmission to S21 and S12 and Reflection to S11 and S22. Note that due to the symmetry of the tee, you can re-use the forward scan data for the reverse data. Then save the file.
>
> The T-Check software has a bug in that the Touchstone file data has to be in Hz. Therefore, you have to change the header line (beginning with "#") to Hz, and change the frequency data to Hz. I did the latter by opening the file in Notepad, copying all the data to Excel, using Text to Columns to get it entered properly, creating a new second column calculated to be 1000000 times the first column, copying everything except column 1 and pasting it back into Notepad and saving the file. In the process the first data line got messed up so I fixed it manually.
>
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, "Geoff Moore" <m0ore@> wrote:
> >
> > Found the application note but can't locate the software. Can you give us a
> > clue.
> >
> > Geoff

> >
> > ----- Original Message -----
> > From: "Sam" <swetterlin@>
> > To: <spectrumanalyzer@yahoogroups.com>
> > Sent: Monday, July 04, 2011 5:48 PM
> > Subject: [spectrumanalyzer] T-Check
> >
> >
> > Rohde & Schwarz has software to calculate a "T-Check" figure of merit for
> > VNAs, based on reflection and transmission scans of a tee whose third branch
> > is terminated in 50 ohms. A result of 100% is ideal and anything within 10%
> > of that is considered very good; 15% deviation is acceptable. On commercial
> > VNAs, this test would be performed after first doing full 10- or 12-term
> > calibration. My objective is to achieve good results without the extra fuss,
> > using normal OSL calibration for reflection and Through calibration for
> > transmission, relying on attenuators to create a good source and load match.
> > I put 7.7 dB on the TG output and 14 dB on the MSA input. I posted a photo
> > of the results:
> >
> > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/252922278/pic/85655545/vie
w?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc
> >
> > Up to 200 MHz, the deviation was only about 1%; it gradually deteriorated
> > but exceeded 10% (the green area in the photo) only just before reaching 1
> > GHz. I have reason to suspect the quality of the tee I used, which may have
> > affected the high frequency performance.
> >
> > The attenuators of course reduce the dynamic range unless you counter them
> > with an amplifier, but the range is still good without an amp. I believe
> > that up to a few hundred MHz, the attenuation could be cut in half and still
> > achieve excellent results.
> >
> > (Note the percentage deviations do not translate directly to percentage
> > accuracy; they are simply the deviation from a perfect figure of merit.)
> >
> > Sam W.
> >
>

8280. Last BOM Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-05 17:57:20 UTC
From: Eric Nystrom
Topic: 8275 Message: 8280

Sam,

I am building the last two boards and found what I think are the last updates to the BOM.

The quantity for the 7SZ74 should be 3 instead of 2.
U5, U8, and U9 on the PDM

There should be 8 instead of 6 of the 330 nh inductors
2 on IF amplifier
2 on Mixer 4
2 on Mixer 2
2 1 on each DDS listed as .33 uh

And I am 1 short on the 10uf 16v X5R caps.

PLL 7x 3 = 21
DDS 2 x 2 = 4
IF AMP 2
PDM 2
MO 2
LOG DET 2
A to D 8

for a total of 41 instead of 40

Eric Nystrom

8281. Re: Last BOM Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-06 15:57:47 UTC
From: Sam
Topic: 8275 Message: 8281

Thanks, I have now updated the posted BOM. I also posted a message about it yesterday, but my messages seem to be delivered by slow boat.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> Sam,
>
> I am building the last two boards and found what I think are the last updates
> to the BOM.
>
> The quantity for the 7SZ74 should be 3 instead of 2.
> U5, U8, and U9 on the PDM
>
> There should be 8 instead of 6 of the 330 nh inductors
> 2 on IF amplifier
> 2 on Mixer 4
> 2 on Mixer 2
> 2 1 on each DDS listed as .33 uh
>
> And I am 1 short on the 10uf 16v X5R caps.
>
> PLL 7x 3 = 21
> DDS 2 x 2 = 4
> IF AMP 2
> PDM 2
> MO 2
> LOG DET 2
> A to D 8
>
> for a total of 41 instead of 40
>
> Eric Nystrom
>

8282. PCMCIA Parallel port adapter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-14 00:43:52 UTC
From: Rex
Topic: 8282 Message: 8282

I am trying to use a pcmcia parallel port adapter for the spectrum analyzer. It shows up as LTP3 with a base range of FFF0 - FFF7.
What should I use as the address in the spectrum analyzer setup ?.
Thanks

rex

8283. Re: [spectrumanalyzer] PCMCIA Parallel port adapter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-14 03:25:21 UTC
From: william sprowls
Topic: 8282 Message: 8283

Hi Rex,
In the Hardware Configuration Manager Window, use FFF0. The MSA software adds 1 to that base number for Status port and 2 for Control Port.
Scotty

--- On Wed, 7/13/11, Rex <r.pearson@...> wrote:

From: Rex <r.pearson@...>
Subject: [spectrumanalyzer] PCMCIA Parallel port adapter
To: spectrumanalyzer@yahoogroups.com
Date: Wednesday, July 13, 2011, 7:43 PM

I am trying to use a pcmcia parallel port adapter for the spectrum analyzer. It shows up as LTP3 with a base range of FFF0 - FFF7.

What should I use as the address in the spectrum analyzer setup ?.

Thanks

rex

8284. Re: PCMCIA Parallel port adapter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-14 23:22:09 UTC
From: Rex
Topic: 8282 Message: 8284

Hi Scotty

I had originally tried using FFF0 and then HEX FFF0, but the specana software saves the latter as HEX 0. Neither works. The hardware works ok on another computer with an internal LPT port so I know its not a hardware issue. The device manager is showing the port is configured correctly and the device is functioning correctly.

Any other ideas or am I not entering the data correctly.

Thanks again

Rex

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Rex,
> In the Hardware Configuration Manager Window, use FFF0. The MSA software adds 1 to that base number for Status port and 2 for Control Port.
> Scotty
>
> --- On Wed, 7/13/11, Rex <r.pearson@...> wrote:
>
> From: Rex <r.pearson@...>
> Subject: [spectrumanalyzer] PCMCIA Parallel port adapter
> To: spectrumanalyzer@yahoogroups.com
> Date: Wednesday, July 13, 2011, 7:43 PM
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>
> I am trying to use a pcmcia parallel port adapter for the spectrum analyzer. It shows up as LTP3 with a base range of FFF0 - FFF7.
>

> What should I use as the address in the spectrum analyzer setup ?.
>
> Thanks
>
>
>
> rex
>

8285. Re: [spectrumanalyzer] Re: PCMCIA Parallel port adapter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-15 05:11:01 UTC
From: william sprowls
Topic: 8282 Message: 8285

Rex,
Run the MSA program
Halt and under menu item Setup, open Hardware Configuration Manager
In LPT Port Address box,enter Hex FFF0(FFFzero, not o)
I tried it and it accepted it.
Scotty

--- On Thu, 7/14/11, Rex <r.pearson@internode.on.net> wrote:

From: Rex <r.pearson@...>
Subject: [spectrumanalyzer] Re: PCMCIA Parallel port adapter
To: spectrumanalyzer@yahoogroups.com
Date: Thursday, July 14, 2011, 6:22 PM

Hi Scotty

I had originally tried using FFF0 and then HEX FFF0, but the specana software saves the latter as HEX 0. Neither works. The hardware works ok on another computer with an internal LPT port so I know its not a hardware issue. The device manager is showing the port is configured correctly and the device is functioning correctly.

Any other ideas or am I not entering the data correctly.

Thanks again

Rex

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:

>

> Hi Rex,

> In the Hardware Configuration Manager Window, use FFF0. The MSA software adds 1 to that base number for Status port and 2 for Control Port.

> Scotty

>

> --- On Wed, 7/13/11, Rex <r.pearson@...> wrote:

>

> From: Rex <r.pearson@...>

> Subject: [spectrumanalyzer] PCMCIA Parallel port adapter

> To: spectrumanalyzer@yahoogroups.com

> Date: Wednesday, July 13, 2011, 7:43 PM

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> I am trying to use a pcmcia parallel port adapter for the spectrum analyzer. It shows up as LTP3 with a base range of FFF0 - FFF7.

>

> What should I use as the address in the spectrum analyzer setup ?.

>

> Thanks

>

>

>

> rex

>

8286. GPIB/Serial Remote control on MSA for auto test?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-15 19:38:38 UTC
From: inlinebeginner
Topic: 8286 Message: 8286

Sam
Do we have a plan to add GPIB/Serial remote control on MSA? If you need to search a spur over a wideband, or do 1000 times phase noise scan over a band for tuner, the remote control might be very useful. The simplest interface might be the serial port, RS232, for remote control. To use this remote function, we can use another serial port #2(can be created with a USB-Serial port converter) on the same PC and talk to the serial port of MSA. By writing some script (or program) connected with prot #2, we can get test data from MSA, if the script is also connected to other equipment, such as a sig gen or multimeter, via GPIB card, some complecated auto test system can be setup with MSA.
Thanks
Lin

8287. Re: GPIB/Serial Remote control on MSA for auto test?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-15 22:12:44 UTC
From: Sam
Topic: 8286 Message: 8287

Lin,
I have no plans to do so, though I have thought about the possibility of communication with another program. I think the best approach would be to put most of the action in a separate program, with communication occurring by that program creating a preferences file with required settings. The MSA would load those settings, do a scan, and if necessary save data to a file, which would be accessible to the second program. That second program would handle any GPIB communication.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> Do we have a plan to add GPIB/Serial remote control on MSA? If you need to search a spur over a wideband, or do 1000 times phase noise scan over a band for tuner, the remote control might be very useful. The simplest interface might be the serial port, RS232, for remote control. To use this remote function, we can use another serial port #2(can be created with a USB-Serial port converter) on the same PC and talk to the serial port of MSA. By writing some script (or program) connected with prot #2, we can get test data from MSA, if the script is also connected to other equipment, such as a sig gen or multimeter, via GPIB card, some complecated auto test system can be setup with MSA.
> Thanks
> Lin
>

8288. Bandwidth of crystal filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-16 03:23:02 UTC
From: Steve
Topic: 8288 Message: 8288

Scotty,

I'm trying to work through the design of crystal filters using the crystals you and Jerry distributed in 2009 and the information on your Crystal Ladder Filter Board <http://www.scottyspectrumanalyzer.com/pwb_clf_5.html> web page.

In a posting sometime ago, you suggested that it would be useful to have resolution bandwidth filters: 2 KHz; 5 to 10 KHz; 30 KHz ; and 100 KHz to 300 KHz.

What is the limit to the bandwidth of this type filter? Can these crystals and the technique described on your web page be used to construct the filters in the bandwidths you suggested?

Thanks.

Steve

--
Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

8289. Re: Bandwidth of crystal filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-19 23:03:39 UTC
From: Sam
Topic: 8288 Message: 8289

Steve,
I believe Scotty once mentioned 7.5 kHz as the practical limit for that filter design. The Amplifilter has made it practical to get a very narrow filter--I got 250 Hz with those crystals--so I would suggest you go with the Amplifilter and also design something in the 2-7 kHz range. For the wider ones, the ceramic filters are very simple and perform well.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
>
> Scotty,
>
> I'm trying to work through the design of crystal filters using the
> crystals you and Jerry distributed in 2009 and the information on your
> Crystal Ladder Filter Board
> <http://www.scottyspectrumanalyzer.com/pwb_clf_5.html> web page.
>
> In a posting sometime ago, you suggested that it would be useful to have
> resolution bandwidth filters: 2 KHz; 5 to 10 KHz; 30 KHz ; and 100 KHz
> to 300 KHz.
>
> What is the limit to the bandwidth of this type filter? Can these
> crystals and the technique described on your web page be used to
> construct the filters in the bandwidths you suggested?
>
> Thanks.
>
> Steve
>

8290. Re: [spectrumanalyzer] Re: Bandwidth of crystal filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-20 09:19:21 UTC
From: Weddig, Henning-Christof
Topic: 8288 Message: 8290

In the latest sissue of QEX there is an interesting article about the maximum bandwidth on can achieve with the ladde4r filter design!

Htis bandwidth depends on ths spacing of the series and parallel resonance of the individual x-tal.

Henning

Am 20.07.2011 01:03, schrieb Sam:
> Steve,
> I believe Scotty once mentioned 7.5 kHz as the practical limit for that
> filter design. The Amplifilter has made it practical to get a very
> narrow filter--I got 250 Hz with those crystals--so I would suggest you
> go with the Amplifilter and also design something in the 2-7 kHz range.
> For the wider ones, the ceramic filters are very simple and perform well.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Steve <steve65@...> wrote:
> >
> > Scotty,
> >
> > I'm trying to work through the design of crystal filters using the
> > crystals you and Jerry distributed in 2009 and the information on your
> > Crystal Ladder Filter Board
> > <http://www.scottyspectrumanalyzer.com/pwb_clf_5.html> web page.
> >
> > In a posting sometime ago, you suggested that it would be useful to have
> > resolution bandwidth filters: 2 KHz; 5 to 10 KHz; 30 KHz ; and 100 KHz
> > to 300 KHz.
> >
> > What is the limit to the bandwidth of this type filter? Can these
> > crystals and the technique described on your web page be used to
> > construct the filters in the bandwidths you suggested?
> >
> > Thanks.
> >
> > Steve
> >
>
>

8291. Bandwidth of crystal filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-20 11:19:56 UTC
From: Cato Andrè Pettersen
Topic: 8288 Message: 8291

On my repeater, the 10.7 MHZ is to be put to - under 150 MHz and + over, why?

8292. Latest signal route board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-25 02:37:04 UTC
From: inlinebeginner
Topic: 8292 Message: 8292

Sam
The Reflect/Transmit and Forward/Reverse signal route relay board files under Files folder look like not the latest. It is the version of Aug 2010. The latest version I got is Oct 1 2010. Is there a newer version after Oct 1, 2010? Maybe we can update the files with the latest.
Thanks
Lin

8293. MSA with Tracking Generator

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-25 05:29:15 UTC
From: kd4lyh
Topic: 8293 Message: 8293

Good Day,
My name is Jeff, Im new to this group. I have an interest in building the MSA with just the tracking Generator. I know that if not using VNA, Mixer 4 and Phase Detector can be omitted. Looking at the block diagram does PLO 1 J2 connect to PLO 3 J3 with Mixer 4 omitted? Any help is appreciated.

Best Regards Jeff
KD4LYH/AAV4RJ

8294. MSA with Tracking Generator

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-25 06:24:39 UTC
From: Jeff
Topic: 8293 Message: 8294

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/1501761058/p\
ic/270600949/view?picmode=large&mode=tn&order=ordinal&start=1&dir=asc

Above is a link to a pic that I uploaded. Sorry about the double post.
Just wanted someone to look at the pic and see if Im on the right track
if I dont use Mixer 4 and the Phase Detector.

JEFF
KD4LYH

8295. Re: [spectrumanalyzer] MSA with Tracking Generator

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-25 12:54:25 UTC
From: william sprowls
Topic: 8293 Message: 8295

Hi Jeff,
 If you don't use VNA, then leave PLO 1-J2 and PLO 3- J3 unconnected. They can be terminated in 50 ohms or left open.
Scotty

--- On Mon, 7/25/11, Jeff <kd4lyh@...> wrote:

From: Jeff <kd4lyh@...>
Subject: [spectrumanalyzer] MSA with Tracking Generator
To: spectrumanalyzer@yahoogroups.com
Date: Monday, July 25, 2011, 1:24 AM

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/1501761058/p\

ic/270600949/view?picmode=large&mode=tn&order=ordinal&start=1&dir=asc

Above is a link to a pic that I uploaded. Sorry about the double post.

Just wanted someone to look at the pic and see if Im on the right track

if I dont use Mixer 4 and the Phase Detector.

JEFF

KD4LYH

8296. Scott,ys MSA with Tracking Generator

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-25 19:54:13 UTC
From: Jeff
Topic: 8296 Message: 8296

I am interested in building an MSA 0-1000 mhz with tracking generator. Could Someone check the pic I posted to see if I have the signal paths correct. The ones in question are in red. See link below. Any help is appreciated.

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/1789775738/p\
ic/1703882710/view?picmode=large&mode=tn&order=ordinal&start=1&dir=asc

Any help is appreciated.

Regards Jeff
KD4LYH/AAV4LYH

8297. Re: [spectrumanalyzer] Scott,ys MSA with Tracking Generator

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-26 00:07:15 UTC
From: Jim Hontoria
Topic: 8296 Message: 8297

Signals in red are OK.

Jim W1JGH

On Mon, Jul 25, 2011 at 3:54 PM, Jeff <kd4lyh@...> wrote:

> **
>
>
> I am interested in building an MSA 0-1000 mhz with tracking generator.
> Could Someone check the pic I posted to see if I have the signal paths
> correct. The ones in question are in red. See link below. Any help is
> appreciated.
>
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/1789775738/p\
> ic/1703882710/view?picmode=large&mode=tn&order=ordinal&start=1&dir=asc<http://groups.yah
oo.com/group/spectrumanalyzer/photos/album/1789775738/pic/1703882710/view?picmode=large&mo
de=tn&order=ordinal&start=1&dir=asc>
>
> Any help is appreciated.
>
> Regards Jeff
> KD4LYH/AAV4LYH
>
>
>

--
Jim G. Hontoria

8298. Measuring Calibration Loads

Yahoo group: spectrumanalyzer (2011)
Date: 2011-07-27 21:32:25 UTC
From: Sam
Topic: 8298 Message: 8298

I have posted a file explaining methods to measure the DC resistance of OSL calibration Loads with great accuracy, even if you don't have a great DMM:

<http://www.wetterlin.org/sam/SA/Operation/MeasCalLoad.pdf>

The circuit could easily be breadboarded without much effort, for a cost of about $10. Such measurements don't need to be made frequently, but it's nice to be able to be precise when necessary.

Sam W.

8299. panel of boards

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-01 12:19:23 UTC
From: Martin
Topic: 8299 Message: 8299

Hi All

I am interested in purchasing a set of the latest revision boards.

The price of the boards through ExpressPCB is great, however postage to AU costs more than the boards, making it expensive (perhaps I have deep pockets and short arms).

I have had a look through the postings and see there have been group buys for the PCB.

Are there spare boards from the previous group buys? Perhaps there is another PCB group buy being considered?

Regards

Marty

8300. Re: panel of boards

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-01 22:26:42 UTC
From: Sam
Topic: 8299 Message: 8300

How much is the postage? Maybe it would be feasible to have several AU buyers share the international postage, and one of them then distribute the boards with local postage?
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Martin" <martin.driscoll@...> wrote:
>
> Hi All
>
> I am interested in purchasing a set of the latest revision boards.
>
> The price of the boards through ExpressPCB is great, however postage to AU costs more than the boards, making it expensive (perhaps I have deep pockets and short arms).
>
> I have had a look through the postings and see there have been group buys for the PCB.
>
> Are there spare boards from the previous group buys? Perhaps there is another PCB group buy being considered?
>
> Regards
>
> Marty
>

8301. Re: [spectrumanalyzer] Re: panel of boards

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-01 22:43:04 UTC
From: Robert Fish
Topic: 8299 Message: 8301

Hi Guys,
When I was selling boards. A full panel of boards in a padded bubble wrap type envelope (I think they were 6"x9") shipped from California to Australia was $4.60 U.S.. It took about a week to get there. That was USPS.

Bob

> How much is the postage? Maybe it would be feasible to have several AU
> buyers share the international postage, and one of them then
> distribute the boards with local postage?
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Martin"
> <martin.driscoll@...> wrote:
> >
> > Hi All
> >
> > I am interested in purchasing a set of the latest revision boards.
> >
> > The price of the boards through ExpressPCB is great, however postage
> to AU costs more than the boards, making it expensive (perhaps I have
> deep pockets and short arms).
> >
> > I have had a look through the postings and see there have been group
> buys for the PCB.
> >
> > Are there spare boards from the previous group buys? Perhaps there
> is another PCB group buy being considered?
> >
> > Regards
> >
> > Marty
> >
>
>

8302. Re: panel of boards

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-02 13:42:55 UTC
From: inlinebeginner
Topic: 8299 Message: 8302

Marty
I have one spare set of Panel Rev E (latest version) at home. You can contact me off list.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Martin" <martin.driscoll@...> wrote:
>
> Hi All
>
> I am interested in purchasing a set of the latest revision boards.
>
> The price of the boards through ExpressPCB is great, however postage to AU costs more than the boards, making it expensive (perhaps I have deep pockets and short arms).
>
> I have had a look through the postings and see there have been group buys for the PCB.
>
> Are there spare boards from the previous group buys? Perhaps there is another PCB group buy being considered?
>
> Regards
>
> Marty
>

8303. replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-02 18:34:14 UTC
From: Amos Ku
Topic: 8303 Message: 8303

Hi,

I am new here, but I am kind of innovative type.

I am thinking to build a even smaller kind of everything-in-it version of the wonderful spectrum analyzer (USB based. Software written in C/C++ instead of Liberty Basic, compact..), and I am doing researches on the possibilities and ways to realize my ambitions.

Hopefully, my ambition does not seem too radical...

Looking briefly at the project, I think that replacing coaxial cavity filter may help reducing the entire volume quite a bit. Searching online for bit, do not seem to find any good substitutes. These are what I have researched and tried:

1. Try to find a pair of high pass filter and low pass filter. But nothing can get closer to 2MHz pass band. The closet match now is 20MHz.

2. My RF friend suggested using RF resonantor. Do not know how to design one yet.

3. Searched research papers in components substituting coaxial cavity. Not very fruitful so far.

Has any long-timer and experienced RF engineers in the group here thought about this question and found something useful? Would you please share with me your experience?

8304. Re: [spectrumanalyzer] Re: panel of boards

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-02 19:14:03 UTC
From: Don Lewis
Topic: 8299 Message: 8304

I am new to the group as well.

Could you pls let me know what the price of a set of PWBs would be and how I maight order them?

Thank you -Don

From: inlinebeginner <inlinebeginner@yahoo.com>
To: spectrumanalyzer@yahoogroups.com
Sent: Tuesday, August 2, 2011 8:42 AM
Subject: [spectrumanalyzer] Re: panel of boards

Marty
I have one spare set of Panel Rev E (latest version) at home. You can contact me off list.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Martin" <martin.driscoll@...> wrote:
>
> Hi All
>
> I am interested in purchasing a set of the latest revision boards.
>
> The price of the boards through ExpressPCB is great, however postage to AU costs more than the boards, making it expensive (perhaps I have deep pockets and short arms).
>
> I have had a look through the postings and see there have been group buys for the PCB.
>
> Are there spare boards from the previous group buys? Perhaps there is another PCB group buy being considered?
>
> Regards
>
> Marty
>

8305. Re: panel of boards

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-02 19:19:59 UTC
From: Sam
Topic: 8299 Message: 8305

The board layouts are in ExpressPCB and can be ordered through them. I think they are posted as a complete panel somewhere; maybe Bob Fish knows?
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Don Lewis <dlewis11193@...> wrote:
>
> I am new to the group as well.
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> Could you pls let me know what the price of a set of PWBs would be and how I maight order them?
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> Thank youÂ Â -Don
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> Â
>
> From: inlinebeginner <inlinebeginner@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Tuesday, August 2, 2011 8:42 AM
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>
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> Marty
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> --- In spectrumanalyzer@yahoogroups.com, "Martin" <martin.driscoll@> wrote:
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> > Regards
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> > Marty
> >

>

8306. Re: replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-02 19:58:39 UTC
From: Sam
Topic: 8303 Message: 8306

Some random thoughts:

The critical features of the cavity filter are reasonable loss and the ability to reject the image frequency. The latter means that it must have good rejection at the center frequency plus two times the second IF frequency. With IF2 near 10.7 MHz, the cavity filter must reject well (say, 90 dB) at 21.4 MHz from center. You can make the cavity filter's job a lot easier by using a broader IF2, such as 21.4 MHz. You would then need to find a supply of RBW filters at that frequency, or crystals at that frequency with which you can design your own filters.

There are apparently surplus avionics filters available somewhere in the 1-1.1 GHz range, but I have no idea of their performance.

It would be feasible to use an LO2 that is about 10% higher (requires some changes to PLO2), which would reduce the cavity filter length by 10%.

If you have machining capability, a box-shaped interdigital filter might do the trick. In such a filter, coupling is direct from resonator to resonator so you avoid a bunch of coupling loops. A similar concept, the comb filter, can be built with somewhat downsized resonators (about 2/3 normal length), if you add piston tuning caps at the ends.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Amos Ku" <amosku@...> wrote:
>
> Hi,
>
> I am new here, but I am kind of innovative type.
>
> I am thinking to build a even smaller kind of everything-in-it version of the wonderful spectrum analyzer (USB based. Software written in C/C++ instead of Liberty Basic, compact..), and I am doing researches on the possibilities and ways to realize my ambitions.
>
> Hopefully, my ambition does not seem too radical...
>
> Looking briefly at the project, I think that replacing coaxial cavity filter may help reducing the entire volume quite a bit. Searching online for bit, do not seem to find any good substitutes. These are what I have researched and tried:
>
> 1. Try to find a pair of high pass filter and low pass filter. But nothing can get closer to 2MHz pass band. The closet match now is 20MHz.
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> 2. My RF friend suggested using RF resonantor. Do not know how to design one yet.
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> 3. Searched research papers in components substituting coaxial cavity. Not very fruitful

so far.
>
> Has any long-timer and experienced RF engineers in the group here thought about this question and found something useful? Would you please share with me your experience?
>

8307. Re: [spectrumanalyzer] Re: replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-02 22:04:26 UTC
From: Dan Andersson
Topic: 8303 Message: 8307

Sam,

After I got the pcb's for this SA, I had second thoughts about the 1-1.1GHz filter for the same reasons you have.

So I deserted the "pure" design and made a mixed batch of "Sam's SA" and the "SA53MV SA". That brought up the filter to 2.1GHZ. There are (was) plenty surplus on that band and I found a rather neat one for small money. Problem solved.

I got me a CNC milling machine from Lumenlab.com, Charlotteville, and can machine alu parts for filters etc.

If you want me to, and produce a drawing, I can make a CAM file and machine a sample or two. The design constraints are, max 2" high and 19" by 19" in X and Y.

I have a couple of VNWA's in the shack, one "commercial USB" version and one early prototype I got when I designed the PCB for Tom's VNWA. 1GHz is measured with good precision. So I should be able to tune the filter with ease.

I also have a different VNWA xtal so I have a wee bit better precision and stability than you usually have from the VNWA.

Just pop me an email if you want me to have a go at this.

Cheers

Dan, M0DFI

On Tuesday 02 August 2011 20:58:39 you wrote:
> Some random thoughts:
>
> The critical features of the cavity filter are reasonable loss and the
> ability to reject the image frequency. The latter means that it must have
> good rejection at the center frequency plus two times the second IF
> frequency. With IF2 near 10.7 MHz, the cavity filter must reject well
> (say, 90 dB) at 21.4 MHz from center. You can make the cavity filter's job
> a lot easier by using a broader IF2, such as 21.4 MHz. You would then need
> to find a supply of RBW filters at that frequency, or crystals at that
> frequency with which you can design your own filters.
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> 1-1.1 GHz range, but I have no idea of their performance.
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> It would be feasible to use an LO2 that is about 10% higher (requires some
> changes to PLO2), which would reduce the cavity filter length by 10%.

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> the trick. In such a filter, coupling is direct from resonator to
> resonator so you avoid a bunch of coupling loops. A similar concept, the
> comb filter, can be built with somewhat downsized resonators (about 2/3
> normal length), if you add piston tuning caps at the ends.
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> Sam W.
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> --- In spectrumanalyzer@yahoogroups.com, "Amos Ku" <amosku@...> wrote:
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> > I am thinking to build a even smaller kind of everything-in-it version of
> > the wonderful spectrum analyzer (USB based. Software written in C/C++
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> > with me your experience?

8308. Re: [spectrumanalyzer] Re: panel of boards

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-02 22:08:29 UTC
From: Robert Fish
Topic: 8299 Message: 8308

Hi Guys,
I had Scotty merge the individual boards into one big layout in PCB Express for me, so I wouldn't screw it up. But it wasn't just the boards required for
one SA/TG/VNA it had several other boards added as well. Mixers, PDM's, Calibration sources, levelers etc. I had to cut them apart before I sold them. The trouble is
I had a hard disk crash here recently and alot of my stuff wasn't backed up so I lost it. My wife has me on a weekly back up routine so it happen to me again.
But, I digress, I will look around and see if I have those files on a disk or flash drive. But like I said it was for a much larger collection of boards than just the basic package.
Somebody that is good with PCB Express should merge the individual board files into a panel for the basic MSA etc. and have somebody double check it before you order it.

Bob

> The board layouts are in ExpressPCB and can be ordered through them. I
> think they are posted as a complete panel somewhere; maybe Bob Fish knows?
> Sam W.
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> --- In spectrumanalyzer@yahoogroups.com
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> > > Regards
> > >
> > > Marty
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> >
>
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8309. Re: [spectrumanalyzer] Re: replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-02 22:13:46 UTC
From: Dan Andersson
Topic: 8303 Message: 8309

"Scotty's SA" I mean....

//Dan

On Tuesday 02 August 2011 23:04:26 you wrote:
> Sam,
>
> After I got the pcb's for this SA, I had second thoughts about the 1-1.1GHz
> filter for the same reasons you have.
>
> So I deserted the "pure" design and made a mixed batch of "Sam's SA" and
> the "SA53MV SA". That brought up the filter to 2.1GHZ. There are (was)
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> I also have a different VNWA xtal so I have a wee bit better precision and
> stability than you usually have from the VNWA.
>
> Just pop me an email if you want me to have a go at this.
>
> Cheers
>
> Dan, M0DFI
>
> On Tuesday 02 August 2011 20:58:39 you wrote:
> > Some random thoughts:
> >
> > The critical features of the cavity filter are reasonable loss and the
> > ability to reject the image frequency. The latter means that it must have
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> > frequency. With IF2 near 10.7 MHz, the cavity filter must reject well
> > (say, 90 dB) at 21.4 MHz from center. You can make the cavity filter's
> > job a lot easier by using a broader IF2, such as 21.4 MHz. You would

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> > comb filter, can be built with somewhat downsized resonators (about 2/3
> > normal length), if you add piston tuning caps at the ends.
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Amos Ku" <amosku@...> wrote:
> > > Hi,
> > >
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> > >
> > > I am thinking to build a even smaller kind of everything-in-it version
> > > of the wonderful spectrum analyzer (USB based. Software written in
> > > C/C++ instead of Liberty Basic, compact..), and I am doing researches
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> > > Hopefully, my ambition does not seem too radical...
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> > > design one yet.
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> > > Not very fruitful so far.
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> > > Has any long-timer and experienced RF engineers in the group here
> > > thought about this question and found something useful? Would you
> > > please share with me your experience?
>
> ---

>
> Yahoo! Groups Links
>
>
>

8310. Re: [spectrumanalyzer] replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-03 01:31:57 UTC
From: Phil Harman
Topic: 8303 Message: 8310

Hi Amos,

I have had success with an alternative to a cavity filter. I use a couple of TOKO 6DFC 1.030GHz Dielectric filters.

Since the skirt selectivity, even with two cascaded filters, is not adequate for a 10.7MHz second IF I increased this to 96MHz.

There are a number of low cost and high performance SAW filters available at 96MHz and I used an RFM SF2135A.

You could then further mix this to 10.7MHz - in my case I used an ADC on its first alias to directly digitise the 96MHz IF and did the filtering digitally.

The front end closely follows Scotty's original design. You can find more details regarding the design here:

<http://openhpsdr.org/wiki/index.php?title=CYCLOPS>

The project has stalled for a number of years due to work on other projects and a problem with high noise sidebands on the two local oscillators. However, we have recently re-started to project and appear to have found the cause of the noise.

In any case there is no problem with either the Dielectric or SAW filters.

Regards

Phil...VK6APH

> Hi,
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> I am thinking to build a even smaller kind of everything-in-it version of
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> about this question and found something useful? Would you please share
> with me your experience?
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>

8311. Re: [spectrumanalyzer] replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-03 01:49:15 UTC
From: Amos Ku
Topic: 8303 Message: 8311

Phil,

Thanks. That is a good news. I believe the cavity filter must be a good stuff but I really cannot have gigantic boxes in my garage. I just do not have room.

Amos

From: Phil Harman <phil@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Tuesday, August 2, 2011 6:31 PM
Subject: Re: [spectrumanalyzer] replacement to coaxial cavity filter

Hi Amos,

I have had success with an alternative to a cavity filter. I use a couple of TOKO 6DFC 1.030GHz Dielectric filters.

Since the skirt selectivity, even with two cascaded filters, is not adequate for a 10.7MHz second IF I increased this to 96MHz.

There are a number of low cost and high performance SAW filters available at 96MHz and I used an RFM SF2135A.

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> about this question and found something useful? Would you please share
> with me your experience?
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8312. Another spectrum analyzer idea to reduce the RF circuitry

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-03 01:54:35 UTC
From: Amos Ku
Topic: 8312 Message: 8312

I have been thinking about using DSP techniques to FFT the incoming signals. This may help to eliminate the need to have some of the mixers/filter. Not sure if anyone has thought about this or tried.

8313. Re: [spectrumanalyzer] replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-03 02:45:27 UTC
From: Berndt Josef Wulf
Topic: 8303 Message: 8313

G'day,

an alternative to the home built coaxial cavity filter is to use filters from avionics IFF transponders. I've retuned a filter and was able to get it within specifications.

cheerio Berndt

On Wed, 3 Aug 2011 11:19:15 you wrote:
> Phil,
>
> Thanks. That is a good news. I believe the cavity filter must be a good
> stuff but I really cannot have gigantic boxes in my garage. I just do not
> have room.
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> To: spectrumanalyzer@yahoogroups.com
> Sent: Tuesday, August 2, 2011 6:31 PM
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> > about this question and found something useful? Would you please share
> > with me your experience?

8314. Re: [spectrumanalyzer] Re: panel of boards

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-03 03:21:05 UTC
From: william sprowls
Topic: 8299 Message: 8314

The full panel of boards is Rev E and can be found on the web page:
http://scottyspectrumanalyzer.com/msaexpress.html

The link to the actual panel is:
http://scottyspectrumanalyzer.com/slim/expressfiles/expressfull_reve.pcb

This was my combo panel and does not include any of Sam's modules.
Scotty

--- On Tue, 8/2/11, Robert Fish <rwfish@...> wrote:

From: Robert Fish <rwfish@...>
Subject: Re: [spectrumanalyzer] Re: panel of boards
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, August 2, 2011, 5:08 PM

Hi Guys,

I had Scotty merge the individual boards into one big layout in PCB
Express for me, so I wouldn't screw it up. But it wasn't just the
boards required for

one SA/TG/VNA it had several other boards added as well. Mixers,
PDM's, Calibration sources, levelers etc. I had to cut them apart
before I sold them. The trouble is

I had a hard disk crash here recently and alot of my stuff wasn't
backed up so I lost it. My wife has me on a weekly back up routine
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But, I digress, I will look around and see if I have those files on
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> Could you pls let me know what the price of a set of
PWBs would be and how I maight order them?

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> Thank youÂ Â -Don

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> From: inlinebeginner <inlinebeginner@...>

> To: spectrumanalyzer@yahoogroups.com

> Sent: Tuesday, August 2, 2011 8:42 AM

> Subject: [spectrumanalyzer] Re: panel of boards

>

>

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> Marty

> I have one spare set of Panel Rev E (latest version)
at home. You can contact me off list.

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"Martin" <martin.driscoll@> wrote:

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great, however postage to AU costs more than the boards,
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buys? Perhaps there is another PCB group buy being
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> > Regards

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8315. Re: [spectrumanalyzer] replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-03 04:52:08 UTC
From: Amos Ku
Topic: 8303 Message: 8315

Cheerio Berndt,

I am not familiar with avionics IFF transponders.

Would you please give me a hint on with filters, such as part number, website...?

Amos

From: Berndt Josef Wulf <wulf@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Tuesday, August 2, 2011 7:45 PM
Subject: Re: [spectrumanalyzer] replacement to coaxial cavity filter

G'day,

an alternative to the home built coaxial cavity filter is to use filters from
avionics IFF transponders. I've retuned a filter and was able to get it within
specifications.

cheerio Berndt

On Wed, 3 Aug 2011 11:19:15 you wrote:
> Phil,
>
> Thanks. That is a good news. I believe the cavity filter must be a good
> stuff but I really cannot have gigantic boxes in my garage. I just do not
> have room.
>
>
> Amos
>
>
>
> ---
> From: Phil Harman <phil@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Tuesday, August 2, 2011 6:31 PM
> Subject: Re: [spectrumanalyzer] replacement to coaxial cavity filter
>
>
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> Hi Amos,
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> I have had success with an alternative to a cavity filter. I use a couple
> of TOKO 6DFC 1.030GHz Dielectric filters.
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> Since the skirt selectivity, even with two cascaded filters, is not
> adequate for a 10.7MHz second IF I increased this to 96MHz.
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> There are a number of low cost and high performance SAW filters available
> at 96MHz and I used an RFM SF2135A.
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> You could then further mix this to 10.7MHz - in my case I used an ADC on
> its first alias to directly digitise the 96MHz IF and did the filtering
> digitally.
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> The front end closely follows Scotty's original design. You can find more
> details regarding the design here:
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> <http://openhpsdr.org/wiki/index.php?title=CYCLOPS>
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> The project has stalled for a number of years due to work on other
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> oscillators. However, we have recently re-started to project and appear
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> In any case there is no problem with either the Dielectric or SAW filters.
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> > I am new here, but I am kind of innovative type.
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> > I am thinking to build a even smaller kind of everything-in-it version of
> > the wonderful spectrum analyzer (USB based. Software written in C/C++
> > instead of Liberty Basic, compact..), and I am doing researches on the
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> > 2. My RF friend suggested using RF resonantor. Do not know how to design
> > one yet.
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> > 3. Searched research papers in components substituting coaxial cavity.
> > Not very fruitful so far.

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> > Has any long-timer and experienced RF engineers in the group here thought
> > about this question and found something useful? Would you please share
> > with me your experience?

8316. Re: [spectrumanalyzer] replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-03 05:24:36 UTC
From: Berndt Josef Wulf
Topic: 8303 Message: 8316

G'day Amos,

No partnumbers, but some models are listed below.

ARC Cessna RT359A
Collins TDR-950
King Radio KT76, KT76A, KT78
Narco AT50A, AT150

These are the more common models found in general avionation.

Most require modifications such fitting suitable connectors, removal of mixer diode etc, but all this is relatively straight forward.

73, Berndt
VK5ABN

On Wed, 3 Aug 2011 14:22:08 you wrote:
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8317. Re: [spectrumanalyzer] replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-03 06:01:35 UTC
From: Amos Ku
Topic: 8303 Message: 8317

I see now.

Looks like this is an expansive option.

I was thinking if I can combine some ready to go parts from companies such as Mini-Circuits to achieve same kind of rejection and selectivity or some other methods.

_____
From: Berndt Josef Wulf <wulf@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Tuesday, August 2, 2011 10:24 PM
Subject: Re: [spectrumanalyzer] replacement to coaxial cavity filter

G'day Amos,

No partnumbers, but some models are listed below.

ARC Cessna RT359A
Collins TDR-950
King Radio KT76, KT76A, KT78
Narco AT50A, AT150

These are the more common models found in general avionation.

Most require modifications such fitting suitable connectors, removal of mixer diode etc, but all this is relatively straight forward.

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8318. Re: [spectrumanalyzer] Another spectrum analyzer idea to reduce the RF circuitry

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-03 07:36:19 UTC
From: Weddig, Henning-Christof
Topic: 8312 Message: 8318

this is what in modern spectrunm analysers is happening!

Am 03.08.2011 03:54, schrieb Amos Ku:
> I have been thinking about using DSP techniques to FFT the incoming
> signals. This may help to eliminate the need to have some of the
> mixers/filter. Not sure if anyone has thought about this or tried.
>
>

8319. Re: Replacement to Coaxial Cavity Filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-03 11:09:57 UTC
From: Greg Broburg
Topic: 8303 Message: 8319

Hello Amos;

Many of these old transponders are sitting in junk
boxes for want of replacement transmitter cavities.
with low output or dead peanut tubes in them.

Expect to pay 50 bucks or less for what you are
wanting. The ARC and Narco units are small silver
plated assemblies, easy to use. Watch out for
oxidation between the top cover and the lower
part of the assembly, I usually clean this area with a
pencil eraser. If the 2-56 threads are stripped on
the lower part of the assembly just use a longer
screw and put a nut on it. This compressive force
on the joint is very important to keep the signal
loss to a minimum.

The King KT76 -76A 78 78A are castings and are
significantly bigger than the Narco and ARC. If you
end up with one of these units contact me and I will
give you more information.

Regards;

Greg

On 8/3/2011 1:01 AM, Amos Ku wrote:
> I see now.
>
> Looks like this is an expansive option.
>
> I was thinking if I can combine some ready to go parts from companies
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> *To:* spectrumanalyzer@yahoogroups.com
> *Sent:* Tuesday, August 2, 2011 10:24 PM
> *Subject:* Re: [spectrumanalyzer] replacement to coaxial cavity filter
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> > From: Berndt Josef Wulf <wulf@... <mailto:wulf%40ping.net.au>>
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> > Sent: Tuesday, August 2, 2011 7:45 PM
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8320. Replacing Coaxial Cavity Filters - Different Approaching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-03 18:42:01 UTC
From: Amos Ku
Topic: 8320 Message: 8320

Thanks for all the hints about using avionic filters. I will definitely searching for these parts.

Just curious if I can do this:

Using a bandpass filter at 1GHz. After down-conversion, I try using a higher Q bandpass filter at lower frequency, a range where I can easily find or make high Q filters.

Since the coaxial cavity filter is there to reject unwanted aliases and select the signals we want, I think having that done in multi-stages may also work.

Of course, more parts may require larger space, but at least, I can find ways to pack them up in the final enclosure. Having a Coaxial Cavity filters does not seen to be very flexible, mechanical wise. There are very limited ways that I can place the volume.

Not sure if anyone has tried this before....

8321. Re: Replacing Coaxial Cavity Filters - Different Approaching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-03 21:31:25 UTC
From: Sam
Topic: 8320 Message: 8321

The IF2 signal is produced by mixing LO2 (1024 MHz) with the cavity filter output; if that output contains 1013.3 MHz, then mixer 2 output will contain 10.7 MHz. Unfortunately, if the cavity filter output contains 1034.7 MHz, the mixer 2 output will also produce 10.7 MHz. Once that 10.7 MHz IF2 signal is produced, there is no way to look back to see whether it came from the source we wanted. And no amount of filtering of IF2 can get rid of the unwanted IF2 signal, which is indistinguishable from the desired IF2 signal.

Therefore, the cavity filter must severely attenuate at 1034.7 MHz, which is 21.4 MHz (more generally, 2*IF2) above the center frequency. That is called image rejection and is the key job of the cavity filter. If it fails, then a strong input signal at, say, 100 MHz will show up at that frequency but will also show up 21.4 MHz away from there. (The ghost appears below the real image, unless I've gotten myself confused.) If you don't get the needed attenuation, increasing the IF2 frequency may solve the problem by putting the image frequency further from the filter center. Changing to a 21.4 MHz IF2 can make a huge difference.

That ghost image will be weaker than the true image by the amount of the attenuation in the cavity filter, so if the cavity filter attenuates 1034.7 MHz by 60 dB more than the center frequency, then the ghost image will be 60 dB lower than the main image. If you assume that you only need "perfection" with signals of -15 dB or lower, and if your noise floor is at -105 dBm, you need the cavity filter to attenuate 1034.7 MHz by at least 90 dB relative to the center frequency attenuation, in order to make the ghost image invisible. You could get by with less attenuation if you were willing to put up with some low level artifacts from strong input signals. But you will certainly want at least 80 dB.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Amos Ku" <amosku@...> wrote:
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8322. Re: [spectrumanalyzer] Re: Replacing Coaxial Cavity Filters - Different Approaching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-03 21:59:33 UTC
From: Amos Ku
Topic: 8320 Message: 8322

I see.

Since imaging rejection is the key here, I think, then, one of alternatives is to have the signals all go through some kind of A/D processing and have the digital signal processing circuit to display the entire spectrum. When we first enter the center frequency, and then, depends on the span, we can let the system to scan enough bandwidth to display all the signals within the span. This way, we do not need ever to worry about which one is the true image or the alias because only very limited mixing will be probably needed.

From: Sam <swetterlin@comcast.net>
To: spectrumanalyzer@yahoogroups.com
Sent: Wednesday, August 3, 2011 2:31 PM
Subject: [spectrumanalyzer] Re: Replacing Coaxial Cavity Filters - Different Approaching

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Sam W.

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8323. Re: Replacing Coaxial Cavity Filters - Different Approaching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-03 22:49:12 UTC
From: Sam
Topic: 8320 Message: 8323

True, but it is much more cost effective to digitize after the cavity filter, and probably after mixer 2, where you have to worry about tens of MHz, rather than directly digitizing the input signal, where you have to worry about several GHz. So you would still rely on the cavity filter for image rejection. BUT, that makes it relatively simple to use a higher IF2, since it would be implemented in software at any desired bandwidth. The higher IF2 in turn makes good image rejection easier.

Also, in the digitization process, you have to worry about the entire bandwidth of signals reaching the ADC, not just the "span" that you want to display. Otherwise, out-of-span signals will be aliased into the span and create a mess.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Amos Ku <amosku@...> wrote:
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> >
>

8324. Re: [spectrumanalyzer] Re: Replacing Coaxial Cavity Filters - Different Approaching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-03 22:56:03 UTC
From: Amos Ku
Topic: 8320 Message: 8324

I see.

No wonder those RF spectrum analyzers are SO expansive. I saw one time that a down converter costing $999. I think it is probably a space vs. cost kind of deal.

_____
From: Sam <swetterlin@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Wednesday, August 3, 2011 3:49 PM
Subject: [spectrumanalyzer] Re: Replacing Coaxial Cavity Filters - Different Approaching

True, but it is much more cost effective to digitize after the cavity filter, and probably after mixer 2, where you have to worry about tens of MHz, rather than directly digitizing the input signal, where you have to worry about several GHz. So you would still rely on the cavity filter for image rejection. BUT, that makes it relatively simple to use a higher IF2, since it would be implemented in software at any desired bandwidth. The higher IF2 in turn makes good image rejection easier.

Also, in the digitization process, you have to worry about the entire bandwidth of signals reaching the ADC, not just the "span" that you want to display. Otherwise, out-of-span signals will be aliased into the span and create a mess.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Amos Ku <amosku@...> wrote:
>
> I see.
>
> Since imaging rejection is the key here, I think, then, one of alternatives is to have the signals all go through some kind of A/D processing and have the digital signal processing circuit to display the entire spectrum. When we first enter the center frequency, and then, depends on the span, we can let the system to scan enough bandwidth to display all the signals within the span. This way, we do not need ever to worry about which one is the true image or the alias because only very limited mixing will be probably needed.
>
>
>
>
> _____
> From: Sam <swetterlin@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Wednesday, August 3, 2011 2:31 PM
> Subject: [spectrumanalyzer] Re: Replacing Coaxial Cavity Filters - Different Approaching
>

>
> Â
> The IF2 signal is produced by mixing LO2 (1024 MHz) with the cavity filter output; if that output contains 1013.3 MHz, then mixer 2 output will contain 10.7 MHz. Unfortunately, if the cavity filter output contains 1034.7 MHz, the mixer 2 output will also produce 10.7 MHz. Once that 10.7 MHz IF2 signal is produced, there is no way to look back to see whether it came from the source we wanted. And no amount of filtering of IF2 can get rid of the unwanted IF2 signal, which is indistinguishable from the desired IF2 signal.
>
> Therefore, the cavity filter must severely attenuate at 1034.7 MHz, which is 21.4 MHz (more generally, 2*IF2) above the center frequency. That is called image rejection and is the key job of the cavity filter. If it fails, then a strong input signal at, say, 100 MHz will show up at that frequency but will also show up 21.4 MHz away from there. (The ghost appears below the real image, unless I've gotten myself confused.) If you don't get the needed attenuation, increasing the IF2 frequency may solve the problem by putting the image frequency further from the filter center. Changing to a 21.4 MHz IF2 can make a huge difference.
>
> That ghost image will be weaker than the true image by the amount of the attenuation in the cavity filter, so if the cavity filter attenuates 1034.7 MHz by 60 dB more than the center frequency, then the ghost image will be 60 dB lower than the main image. If you assume that you only need "perfection" with signals of -15 dB or lower, and if your noise floor is at -105 dBm, you need the cavity filter to attenuate 1034.7 MHz by at least 90 dB relative to the center frequency attenuation, in order to make the ghost image invisible. You could get by with less attenuation if you were willing to put up with some low level artifacts from strong input signals. But you will certainly want at least 80 dB.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "Amos Ku" <amosku@> wrote:
> >
> > Thanks for all the hints about using avionic filters. I will definitely searching for these parts.
> >
> > Just curious if I can do this:
> >
> > Using a bandpass filter at 1GHz. After down-conversion, I try using a higher Q bandpass filter at lower frequency, a range where I can easily find or make high Q filters.
> >
> > Since the coaxial cavity filter is there to reject unwanted aliases and select the signals we want, I think having that done in multi-stages may also work.
> >
> > Of course, more parts may require larger space, but at least, I can find ways to pack them up in the final enclosure. Having a Coaxial Cavity filters does not seen to be very flexible, mechanical wise. There are very limited ways that I can place the volume.
> >
> > Not sure if anyone has tried this before....
> >
>

8325. Why is PLO3 up on SA mode?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-03 23:24:46 UTC
From: jghbeta
Topic: 8325 Message: 8325

PLO3 is always up. Other than to simplify the code is there a good reason? The problem I have is that, while IN SA MODE, if I leave the TG connected to the SA input , I get crosstalk from PLO3. In my humble opinion, PLO3 should not be active at all in SA mode.

Jim W1JGH

8326. Re: Why is PLO3 up on SA mode?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 01:02:52 UTC
From: Sam
Topic: 8325 Message: 8326

Yes, if the VCO had a disable pin, it would be a good idea to disable it when it is not needed. Unfortunately, it doesn't.

In pure SA mode, why would you have the TG attached to the input? If you want to use the TG, you need PLO3.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> PLO3 is always up. Other than to simplify the code is there a good reason? The problem I have is that, while IN SA MODE, if I leave the TG connected to the SA input , I get crosstalk from PLO3. In my humble opinion, PLO3 should not be active at all in SA mode.
>
> Jim W1JGH
>

8327. Re: [spectrumanalyzer] Re: Why is PLO3 up on SA mode?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 01:06:47 UTC
From: Jim Hontoria
Topic: 8325 Message: 8327

Well... If I forget to disconnect the cable after being in TG mode I get
strange things that shouldn't be there. it takes a while to figure it out,
that's all.

Jim W1JGH

On Wed, Aug 3, 2011 at 9:02 PM, Sam <swetterlin@comcast.net> wrote:

> **
>
>
> Yes, if the VCO had a disable pin, it would be a good idea to disable it
> when it is not needed. Unfortunately, it doesn't.
>
> In pure SA mode, why would you have the TG attached to the input? If you
> want to use the TG, you need PLO3.
>
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
> >
> > PLO3 is always up. Other than to simplify the code is there a good
> reason? The problem I have is that, while IN SA MODE, if I leave the TG
> connected to the SA input , I get crosstalk from PLO3. In my humble opinion,
> PLO3 should not be active at all in SA mode.
> >
> > Jim W1JGH
> >
>
>
>

--
Jim G. Hontoria

8328. Re: [spectrumanalyzer] Why is PLO3 up on SA mode?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 01:20:17 UTC
From: william sprowls
Topic: 8325 Message: 8328

Hi Jim,
 I thought long and hard about that when the Tracking Generator was in conception. To be effective, the two RF outputs of PLO 3 must go to "zero" or to at least, a low enough level so as not to interfere with the other SA components. Turning off the VCO 3 would be the best way to do it. This would require switching the power to the VCO (on-off).
 My thoughts were that the extra real estate and component count didn't justify it. Just commanding the PLO 3 to some out-of-the-way frequency was easiest. In the SA Mode, the TG output is never connected to anything, so interference is at its minimum.
 Now that the original -5 volts is no longer used in the PLO module, there is some room to play. We can do this with software and some active component but the really easy way to control the VCO voltage is to:
1. Inside the module, cut the +10v trace between R28/C28 and U5.
2. Tie P1-7 to the input of U5.
3. Add a .01 uf and a 10 ufd from P1-7 to ground for RFI supression.
4. Add an On-Off switch to your MSA.
5. Tie one pole to the +10v distribution on the Control Board
6. Tie the other pole to PLO 3, P1-7.
You can now turn the TG (Sig Gen) on and off.
Scotty

--- On Wed, 8/3/11, jghbeta <jghalpha@...> wrote:

From: jghbeta <jghalpha@...>
Subject: [spectrumanalyzer] Why is PLO3 up on SA mode?
To: spectrumanalyzer@yahoogroups.com
Date: Wednesday, August 3, 2011, 6:24 PM

PLO3 is always up. Other than to simplify the code is there a good reason? The problem I have is that, while IN SA MODE, if I leave the TG connected to the SA input , I get crosstalk from PLO3. In my humble opinion, PLO3 should not be active at all in SA mode.

Jim W1JGH

8329. Re: [spectrumanalyzer] Why is PLO3 up on SA mode?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 01:41:21 UTC
From: Jim Hontoria
Topic: 8325 Message: 8329

That switch could be handled from software. Also I would add a panel LED to show the TG as running.

Jim Hontoria, w1jgh

On Aug 3, 2011, at 21:20, william sprowls <wsprowls@...> wrote:

> Hi Jim,
> I thought long and hard about that when the Tracking Generator was in conception. To be effective, the two RF outputs of PLO 3 must go to "zero" or to at least, a low enough level so as not to interfere with the other SA components. Turning off the VCO 3 would be the best way to do it. This would require switching the power to the VCO (on-off).
> My thoughts were that the extra real estate and component count didn't justify it. Just commanding the PLO 3 to some out-of-the-way frequency was easiest. In the SA Mode, the TG output is never connected to anything, so interference is at its minimum.
> Now that the original -5 volts is no longer used in the PLO module, there is some room to play. We can do this with software and some active component but the really easy way to control the VCO voltage is to:
> 1. Inside the module, cut the +10v trace between R28/C28 and U5.
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> 3. Add a .01 uf and a 10 ufd from P1-7 to ground for RFI supression.
> 4. Add an On-Off switch to your MSA.
> 5. Tie one pole to the +10v distribution on the Control Board
> 6. Tie the other pole to PLO 3, P1-7.
> You can now turn the TG (Sig Gen) on and off.
> Scotty
>
> --- On Wed, 8/3/11, jghbeta <jghalpha@...> wrote:
>
> From: jghbeta <jghalpha@...>
> Subject: [spectrumanalyzer] Why is PLO3 up on SA mode?
> To: spectrumanalyzer@yahoogroups.com
> Date: Wednesday, August 3, 2011, 6:24 PM
>
>
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>
> Jim W1JGH
>
>

8330. Re: [spectrumanalyzer] Re: Replacing Coaxial Cavity Filters - Different Approaching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 02:21:05 UTC
From: Phil Harman
Topic: 8320 Message: 8330

There is an alternative approach that can be used when FFT filtering of the signal is used that removes the need for a high IF and narrow filters.

That is to deliberately create an image signal and remove it in software.

For example, if we use a single IF at say 10.7MHz with a wanted signal at say 100MHz we can use a LO of either 110.7MHz or 89.3MHz. Both will mix the 100MHz signal to 10.7MHz where we use an ADC, FFT and save the results.

So we do two measure measurements with two LO frequencies - if the results are the same using either LO then we conclude the samples are valid and display them.

When using the 110.7MHz LO a signal at 121.4MHz will also produce a signal at 10.7MHz. But this will not be present when the LO is moved to 89.3MHz. Similarly with the LO at 89.3MHz then a signal at 78.6MHz will produce a signal at 10.7MHz. Again this will not be present when using the 110.7MHz LO.

Only when both LOs give 'similar' results is the raw data displayed. If a signal does not appear when using both LOs then that signal is digitally subtracted from the signal that is displayed.

This is a very simplistic explanation - in practice the 'devil is in the software' but there is at least one commercial SA that successfully uses this technique.

Phil...VK6APH

> The IF2 signal is produced by mixing LO2 (1024 MHz) with the cavity filter
> output; if that output contains 1013.3 MHz, then mixer 2 output will
> contain 10.7 MHz. Unfortunately, if the cavity filter output contains
> 1034.7 MHz, the mixer 2 output will also produce 10.7 MHz. Once that 10.7
> MHz IF2 signal is produced, there is no way to look back to see whether it
> came from the source we wanted. And no amount of filtering of IF2 can get
> rid of the unwanted IF2 signal, which is indistinguishable from the
> desired IF2 signal.
>
> Therefore, the cavity filter must severely attenuate at 1034.7 MHz, which
> is 21.4 MHz (more generally, 2*IF2) above the center frequency. That is
> called image rejection and is the key job of the cavity filter. If it
> fails, then a strong input signal at, say, 100 MHz will show up at that
> frequency but will also show up 21.4 MHz away from there. (The ghost
> appears below the real image, unless I've gotten myself confused.) If you

> don't get the needed attenuation, increasing the IF2 frequency may solve
> the problem by putting the image frequency further from the filter center.
> Changing to a 21.4 MHz IF2 can make a huge difference.
>
> That ghost image will be weaker than the true image by the amount of the
> attenuation in the cavity filter, so if the cavity filter attenuates
> 1034.7 MHz by 60 dB more than the center frequency, then the ghost image
> will be 60 dB lower than the main image. If you assume that you only need
> "perfection" with signals of -15 dB or lower, and if your noise floor is
> at -105 dBm, you need the cavity filter to attenuate 1034.7 MHz by at
> least 90 dB relative to the center frequency attenuation, in order to make
> the ghost image invisible. You could get by with less attenuation if you
> were willing to put up with some low level artifacts from strong input
> signals. But you will certainly want at least 80 dB.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "Amos Ku" <amosku@...> wrote:
>>
>> Thanks for all the hints about using avionic filters. I will definitely
>> searching for these parts.
>>
>> Just curious if I can do this:
>>
>> Using a bandpass filter at 1GHz. After down-conversion, I try using a
>> higher Q bandpass filter at lower frequency, a range where I can easily
>> find or make high Q filters.
>>
>> Since the coaxial cavity filter is there to reject unwanted aliases and
>> select the signals we want, I think having that done in multi-stages may
>> also work.
>>
>> Of course, more parts may require larger space, but at least, I can find
>> ways to pack them up in the final enclosure. Having a Coaxial Cavity
>> filters does not seen to be very flexible, mechanical wise. There are
>> very limited ways that I can place the volume.
>>
>> Not sure if anyone has tried this before....
>>
>
>
>

8331. Re: [spectrumanalyzer] Another spectrum analyzer idea to reduce the RF circuitry

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 05:20:14 UTC
From: William Dillon
Topic: 8312 Message: 8331

I've been considering this also.

My current line of thinking (I will try with my kit when it gets working well enough) is to split the signal coming from the log detector to the phase detector (should be the 10.7 Mhz IF with constant amplitude) and install a off-the-shelf SDR (software defined radio) kit. Many of these work quite well at 10Mhz. The idea is that they down-convert this IF (using sampling) to DC. The I and Q (in phase and 90 degrees out of phase) can be used to demodulate any signals present. The limitation of this system is the bandwidth of the output. Typically, people plug these into sound cards, setting the bandwidth at 48kHz (before anyone invokes nyquist, you get the full bandwidth because there is an I and Q). It is a good idea to low-pass filter the baseband to ensure that you don't get aliasing from higher frequencies. I've also considered a design with a 2 M sample/second ADC with a USB full-speed interface, but that's way out there.

Anyway, sorry for the ramble.

On Aug 3, 2011, at 12:36 AM, Weddig, Henning-Christof wrote:

> this is what in modern spectrunm analysers is happening!
>
> Am 03.08.2011 03:54, schrieb Amos Ku:
>> I have been thinking about using DSP techniques to FFT the incoming
>> signals. This may help to eliminate the need to have some of the
>> mixers/filter. Not sure if anyone has thought about this or tried.
>>
>>
>
>
> ------------------------------------
>
> Yahoo! Groups Links
>
>
>

8332. Re: panel of boards

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 09:12:01 UTC
From: taishan_ma
Topic: 8299 Message: 8332

```
I have some extra of these boards, please refer to:
http://www.qsl.net/bg6khc/my_version2.htm

USD $38 for 18 pcbs. Slim_cal is also available.

Thanks
BG6KHC
```

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> The full panel of boards is Rev E and can be found on the web page:
> http://scottyspectrumanalyzer.com/msaexpress.html
>
> The link to the actual panel is:
> http://scottyspectrumanalyzer.com/slim/expressfiles/expressfull_reve.pcb
>
> This was my combo panel and does not include any of Sam's modules.
> Scotty
>
> --- On Tue, 8/2/11, Robert Fish <rwfish@...> wrote:
>
> From: Robert Fish <rwfish@...>
> Subject: Re: [spectrumanalyzer] Re: panel of boards
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, August 2, 2011, 5:08 PM
>
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> Hi Guys,
>
> I had Scotty merge the individual boards into one big layout in PCB
> ExpressÂ for me, so I wouldn't screw it up. But it wasn't just the
> boards required for
>
> one SA/TG/VNA it had several other boards added as well. Mixers,
> PDM's, Calibration sources, levelers etc. I had to cut them apart
> before I sold them. The trouble is
>
> I had a hard disk crash here recently and alot of my stuff wasn't
> backed up so I lost it. My wife has me on a weekly back up routine
> so it happen to me again.
>
> But, I digress, I will look around and see if I have those files on
> a disk or flash drive. But like I said it was for a much larger
> collection of boards than just the basic package.
>
> Somebody that is good with PCB Express should merge the individual
> board files into a panel for the basic MSA etc. and have somebody
> double check it before you order it.
>
>
>
> Bob
>
>
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>
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>
> The board layouts are in ExpressPCB and can be ordered
> through them. I think they are posted as a complete panel
> somewhere; maybe Bob Fish knows?
>
> Sam W.
>
>
>
> --- In spectrumanalyzer@yahoogroups.com,
> Don Lewis <dlewis11193@> wrote:
>
> >
>
> > I am new to the group as well.
>
> > Ã□Â
>

> > Could you pls let me know what the price of a set of
> PWBs would be and how I maight order them?
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> > Ã□Â
>
> > Thank youÃ□Â Ã□Â -Don
>
> > Ã□Â
>
> > Ã□Â
>
> >
>
> > From: inlinebeginner <inlinebeginner@>
>
> > To: spectrumanalyzer@yahoogroups.com
>
> > Sent: Tuesday, August 2, 2011 8:42 AM
>
> > Subject: [spectrumanalyzer] Re: panel of boards
>
> >
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> >
>
> > Ã□Â
>
> > Marty
>
> > I have one spare set of Panel Rev E (latest version)
> at home. You can contact me off list.
>
> > Lin
>
> >
>
> > --- In spectrumanalyzer@yahoogroups.com,
> "Martin" <martin.driscoll@> wrote:
>
> > >
>
> > > Hi All
>
> > >
>
> > > I am interested in purchasing a set of the
> latest revision boards.
>
> > >

>
> > > The price of the boards through ExpressPCB is
> great, however postage to AU costs more than the boards,
> making it expensive (perhaps I have deep pockets and short
> arms).
>
> > >
>
> > > I have had a look through the postings and see
> there have been group buys for the PCB.
>
> > >
>
> > > Are there spare boards from the previous group
> buys? Perhaps there is another PCB group buy being
> considered?
>
> > >
>
> > > Regards
>
> > >
>
> > > Marty
>
> > >
>
> >
>

8333. Re: panel of boards

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 10:58:37 UTC
From: Martin
Topic: 8299 Message: 8333

Hi again All

Thanks very much to the people who have replied, it is great to see a group so active. I have been away for the last couple of days, please excuse my late reply.

There were heaps of replies both on and off the group, in response to the questions about the pricing ...

I emailed ExpressPCB who advised there is no other shipping option other than the one (3 day delivery) offered in the software.

The price of the boards looks great, as do the shipping cost to the US, however at around $60USD for 1 set minboards (3 miniboards in total) to Australia, on top of the manufacture cost (around $50USD) it makes this PCB option an expensive exercise.

And thanks to those who pointed out the location of the panels online and the many other offers of assistance.

Many thanks, regards

Marty

--- In spectrumanalyzer@yahoogroups.com, "Martin" <martin.driscoll@...> wrote:
>
> Hi All
>
> I am interested in purchasing a set of the latest revision boards.
>
> The price of the boards through ExpressPCB is great, however postage to AU costs more than the boards, making it expensive (perhaps I have deep pockets and short arms).
>
> I have had a look through the postings and see there have been group buys for the PCB.
>
> Are there spare boards from the previous group buys? Perhaps there is another PCB group buy being considered?
>
> Regards
>
> Marty
>

8334. Re: Why is PLO3 up on SA mode?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 12:18:15 UTC
From: Sam
Topic: 8325 Message: 8334

I still don't see the problem that would be solved. If the problem is that the TG was accidentally left attached to the input when you switched to SA mode, there is a more obvious problem: you're trying to look at SA signals from an external signal source that you forgot to attach.

The interference in SA mode when the TG is not connected amounts to a few spurs that can be moved/eliminated by changing the SG frequency. The software could flip a bit when in SA mode that the user could connect to a PLO3 switch if desired, but we would have to dedicate a latch bit for that purpose. We do have a largely unused latch, which I think was reserved for parallel DDS control. I doubt anyone would do that at this point, so maybe we have bits to play with.

Of course, if PLO3 is turned off in SA mode, then the Signal Generator could not be used unless we provide an override that lets the user turn it back on.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> That switch could be handled from software. Also I would add a panel LED to show the TG as running.
>
> Jim Hontoria, w1jgh
>
> On Aug 3, 2011, at 21:20, william sprowls <wsprowls@...> wrote:
>
> > Hi Jim,
> > I thought long and hard about that when the Tracking Generator was in conception. To be effective, the two RF outputs of PLO 3 must go to "zero" or to at least, a low enough level so as not to interfere with the other SA components. Turning off the VCO 3 would be the best way to do it. This would require switching the power to the VCO (on-off).
> > My thoughts were that the extra real estate and component count didn't justify it. Just commanding the PLO 3 to some out-of-the-way frequency was easiest. In the SA Mode, the TG output is never connected to anything, so interference is at its minimum.
> > Now that the original -5 volts is no longer used in the PLO module, there is some room to play. We can do this with software and some active component but the really easy way to control the VCO voltage is to:
> > 1. Inside the module, cut the +10v trace between R28/C28 and U5.
> > 2. Tie P1-7 to the input of U5.
> > 3. Add a .01 uf and a 10 ufd from P1-7 to ground for RFI supression.
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> > You can now turn the TG (Sig Gen) on and off.
> > Scotty
> >

> > --- On Wed, 8/3/11, jghbeta <jghalpha@...> wrote:
> >
> > From: jghbeta <jghalpha@...>
> > Subject: [spectrumanalyzer] Why is PLO3 up on SA mode?
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Wednesday, August 3, 2011, 6:24 PM
> >
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> > PLO3 is always up. Other than to simplify the code is there a good reason? The problem I have is that, while IN SA MODE, if I leave the TG connected to the SA input , I get crosstalk from PLO3. In my humble opinion, PLO3 should not be active at all in SA mode.
> >
> > Jim W1JGH
> >
> >
>

8335. Re: panel of boards

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 12:24:46 UTC
From: Sam
Topic: 8299 Message: 8335

Ah, so it is the overnight delivery that jacks up the cost. Maybe a non-Miniboard order would be more cost effective because it lets you select other delivery options (I think). A full set of boards would require several Miniboard orders anyway. Other options let you order all the boards in one big panel (which you would have to cut apart).
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Martin" <martin.driscoll@...> wrote:
>
>
>
>
> Hi again All
>
> Thanks very much to the people who have replied, it is great to see a group so active. I have been away for the last couple of days, please excuse my late reply.
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> There were heaps of replies both on and off the group, in response to the questions about the pricing ...
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> And thanks to those who pointed out the location of the panels online and the many other offers of assistance.
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> Many thanks, regards
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> Marty
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> --- In spectrumanalyzer@yahoogroups.com, "Martin" <martin.driscoll@> wrote:
> >
> > Hi All
> >
> > I am interested in purchasing a set of the latest revision boards.
> >
> > The price of the boards through ExpressPCB is great, however postage to AU costs more than the boards, making it expensive (perhaps I have deep pockets and short arms).
> >
> > I have had a look through the postings and see there have been group buys for the PCB.

> >
> > Are there spare boards from the previous group buys? Perhaps there is another PCB group buy being considered?
> >
> > Regards
> >
> > Marty
> >
>

8336. Re: Measuring Calibration Loads

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 13:12:31 UTC
From: Sam
Topic: 8298 Message: 8336

I updated the document with Appendix C, showing some test results. I used a 4 1/2 digit meter to see what the max potential accuracy would be, and it appears to be 0.05% or better. I figure the lower accuracy and resolution of a 3 1/2 digit meter would still give resistance accuracy of 0.1% or better using the circuit described in the document.

With 0.1% accuracy, you could use a commercial termination as a load, rather than homemade loads with 0.1% resistors. The latter still have a place, but they are a bit more fragile. As long as you tell the MSA what the load resistance is, you should get good results. You also need to estimate the internal delay, though error in that estimate is not a significant factor if the resistance is not too far from 50 ohms. I have collections of several brands of SMA terminations, which I bought on eBay knowing that their VSWR specs were good. I found two that are almost exactly 50 ohms, and many that are within 0.2 ohms of 50 ohms. In fact, to measure something several ohms from 50 I had to use a 14 dB attenuator with its end open or shorted.

On the other hand, my collection of BNC terminations were mostly several ohms from 50. Nothing associated with BNC seems very precise.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have posted a file explaining methods to measure the DC resistance of OSL calibration Loads with great accuracy, even if you don't have a great DMM:
>
> <http://www.wetterlin.org/sam/SA/Operation/MeasCalLoad.pdf>
>
> The circuit could easily be breadboarded without much effort, for a cost of about $10. Such measurements don't need to be made frequently, but it's nice to be able to be precise when necessary.
>
> Sam W.
>

8337. Re: [spectrumanalyzer] Another spectrum analyzer idea to reduce the RF circuitry

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 13:16:52 UTC
From: william sprowls
Topic: 8312 Message: 8337

Hi William and All,
First off, I don't consider discussions of any spectrum analyzer system "rambling". This is probably a good place to bring up ideas.
Here is my two cents worth:
There are two categories of SA's, analog and digital. Analogs have simple topologies but require significant attention to layouts, crosstalk, interference, spurious, etc. Digital topologies seem even simpler, but are deceiving due to the software required to make them work.
I can assure you that the conception and design of the MSA was not done without knowledge of DSP techniques. My goal was a high quality, yet inexpensive spectrum analyzer. In 2000, DSP was cumbersome and very expensive. Not conducive to home construction. Now, in 2011, it is much simpler and very affordable. However, the software is no less extensive. I can safely say that it would be impossible using Liberty Basic. For this reason I have no plans to convert or retrofit the MSA into a DSP environment.
With that said, there is good reason for group members to support anyone who would like to pursue a DSP based analyzer.
Scotty

--- On Thu, 8/4/11, William Dillon <hpux735@...> wrote:

> From: William Dillon <hpux735@...m>
> Subject: Re: [spectrumanalyzer] Another spectrum analyzer idea to reduce the RF circuitry
> To: spectrumanalyzer@yahoogroups.com
> Date: Thursday, August 4, 2011, 12:20 AM
> I've been considering this also.
>
> My current line of thinking (I will try with my kit when it
> gets working well enough) is to split the signal coming from
> the log detector to the phase detector (should be the 10.7
> Mhz IF with constant amplitude) and install a off-the-shelf
> SDR (software defined radio) kit. Many of these work
> quite well at 10Mhz. The idea is that they
> down-convert this IF (using sampling) to DC. The I and
> Q (in phase and 90 degrees out of phase) can be used to
> demodulate any signals present. The limitation of this
> system is the bandwidth of the output. Typically,
> people plug these into sound cards, setting the bandwidth at
> 48kHz (before anyone invokes nyquist, you get the full
> bandwidth because there is an I and Q). It is a good
> idea to low-pass filter the baseband to ensure that you
> don't get aliasing from higher frequencies. I've also
> considered a design with a 2 M sample/second ADC with a USB
> full-speed interface, but that's way out there.
>

> Anyway, sorry for the ramble.
>
> On Aug 3, 2011, at 12:36 AM, Weddig, Henning-Christof
> wrote:
>
> > this is what in modern spectrunm analysers is
> happening!
> >
> > Am 03.08.2011 03:54, schrieb Amos Ku:
> >> I have been thinking about using DSP techniques to
> FFT the incoming
> >> signals. This may help to eliminate the need to
> have some of the
> >> mixers/filter. Not sure if anyone has thought
> about this or tried.
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> Yahoo! Groups Links
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>   spectrumanalyzer-fullfeatured@yahoogroups.com
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8338. Re: [spectrumanalyzer] Re: Why is PLO3 up on SA mode?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 13:27:37 UTC
From: Jim Hontoria
Topic: 8325 Message: 8338

I will run some tests in SA mode with and without TG power.
Obviously I'll publish the results to the group.
If there is any indication of a difference (and a few spurs are sufficient)
I will try a manual switch or even P1D7 (the third unused bit for the RBW
switch, PB7 in USB) since it is available.
Jim

On Thu, Aug 4, 2011 at 8:18 AM, Sam <swetterlin@...> wrote:

> **
>
>
> I still don't see the problem that would be solved. If the problem is that
> the TG was accidentally left attached to the input when you switched to SA
> mode, there is a more obvious problem: you're trying to look at SA signals
> from an external signal source that you forgot to attach.
>
> The interference in SA mode when the TG is not connected amounts to a few
> spurs that can be moved/eliminated by changing the SG frequency. The
> software could flip a bit when in SA mode that the user could connect to a
> PLO3 switch if desired, but we would have to dedicate a latch bit for that
> purpose. We do have a largely unused latch, which I think was reserved for
> parallel DDS control. I doubt anyone would do that at this point, so maybe
> we have bits to play with.
>
> Of course, if PLO3 is turned off in SA mode, then the Signal Generator
> could not be used unless we provide an override that lets the user turn it
> back on.
>
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...>
> wrote:
> >
> > That switch could be handled from software. Also I would add a panel LED
> to show the TG as running.
> >
> > Jim Hontoria, w1jgh
> >
> > On Aug 3, 2011, at 21:20, william sprowls <wsprowls@...> wrote:
> >
> > > Hi Jim,
> > > I thought long and hard about that when the Tracking Generator was in
> conception. To be effective, the two RF outputs of PLO 3 must go to "zero"

> or to at least, a low enough level so as not to interfere with the other SA
> components. Turning off the VCO 3 would be the best way to do it. This would
> require switching the power to the VCO (on-off).
> > > My thoughts were that the extra real estate and component count didn't
> justify it. Just commanding the PLO 3 to some out-of-the-way frequency was
> easiest. In the SA Mode, the TG output is never connected to anything, so
> interference is at its minimum.
> > > Now that the original -5 volts is no longer used in the PLO module,
> there is some room to play. We can do this with software and some active
> component but the really easy way to control the VCO voltage is to:
> > > 1. Inside the module, cut the +10v trace between R28/C28 and U5.
> > > 2. Tie P1-7 to the input of U5.
> > > 3. Add a .01 uf and a 10 ufd from P1-7 to ground for RFI supression.
> > > 4. Add an On-Off switch to your MSA.
> > > 5. Tie one pole to the +10v distribution on the Control Board
> > > 6. Tie the other pole to PLO 3, P1-7.
> > > You can now turn the TG (Sig Gen) on and off.
> > > Scotty
> > >
> > > --- On Wed, 8/3/11, jghbeta <jghalpha@...> wrote:
> > >
> > > From: jghbeta <jghalpha@...>
>
> > > Subject: [spectrumanalyzer] Why is PLO3 up on SA mode?
> > > To: spectrumanalyzer@yahoogroups.com
> > > Date: Wednesday, August 3, 2011, 6:24 PM
> > >
> > >
> > > PLO3 is always up. Other than to simplify the code is there a good
> reason? The problem I have is that, while IN SA MODE, if I leave the TG
> connected to the SA input , I get crosstalk from PLO3. In my humble opinion,
> PLO3 should not be active at all in SA mode.
> > >
> > > Jim W1JGH
> > >
> > >
> >
>
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>

--
Jim G. Hontoria

8339. Re: panel of boards

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 14:09:36 UTC
From: inlinebeginner
Topic: 8299 Message: 8339

These board are not as same as Panel Rev E, I hope the changes won't cause RF leakage and create toubles.
I have done a 10.7MHz RBW filter, the rejection difference between a ' RF tight' and non-RF tight, can be 20dB (from 60 to 80dB), refer to the photo here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/537353207/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc

Lin

--- In spectrumanalyzer@yahoogroups.com, "taishan_ma" <taishan_ma@...> wrote:
>
> I have some extra of these boards, please refer to: http://www.qsl.net/bg6khc/my_version2.htm
>
> USD $38 for 18 pcbs. Slim_cal is also available.
>
> Thanks
> BG6KHC
>
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> >
> > The full panel of boards is Rev E and can be found on the web page:
> > http://scottyspectrumanalyzer.com/msaexpress.html
> >
> > The link to the actual panel is:
> > http://scottyspectrumanalyzer.com/slim/expressfiles/expressfull_reve.pcb
> >
> > This was my combo panel and does not include any of Sam's modules.
> > Scotty
> >
> > --- On Tue, 8/2/11, Robert Fish <rwfish@> wrote:
> >
> > From: Robert Fish <rwfish@>
> > Subject: Re: [spectrumanalyzer] Re: panel of boards
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Tuesday, August 2, 2011, 5:08 PM
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> >
> > Hi Guys,
> >
> > I had Scotty merge the individual boards into one big layout in PCB
> > ExpressÂ for me, so I wouldn't screw it up. But it wasn't just the
> > boards required for
> >
> > one SA/TG/VNA it had several other boards added as well. Mixers,
> > PDM's, Calibration sources, levelers etc. I had to cut them apart
> > before I sold them. The trouble is
> >
> > I had a hard disk crash here recently and alot of my stuff wasn't
> > backed up so I lost it. My wife has me on a weekly back up routine
> > so it happen to me again.
> >
> > But, I digress, I will look around and see if I have those files on
> > a disk or flash drive. But like I said it was for a much larger
> > collection of boards than just the basic package.
> >
> > Somebody that is good with PCB Express should merge the individual
> > board files into a panel for the basic MSA etc. and have somebody
> > double check it before you order it.
> >
> >
> >
> > Bob
> >
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> > Â
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> >
> > The board layouts are in ExpressPCB and can be ordered
> > through them. I think they are posted as a complete panel
> > somewhere; maybe Bob Fish knows?
> >
> > Sam W.
> >

> >
> >
> > --- In spectrumanalyzer@yahoogroups.com,
> > Don Lewis <dlewis11193@> wrote:
> >
> > >
> >
> > > I am new to the group as well.
> >
> > > ÃÂ
> >
> > > Could you pls let me know what the price of a set of
> > PWBs would be and how I maight order them?
> >
> > > ÃÂ
> >
> > > Thank youÃÂ ÃÂ -Don
> >
> > > ÃÂ
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> > > ÃÂ
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> >
> > > From: inlinebeginner <inlinebeginner@>
> >
> > > To: spectrumanalyzer@yahoogroups.com
> >
> > > Sent: Tuesday, August 2, 2011 8:42 AM
> >
> > > Subject: [spectrumanalyzer] Re: panel of boards
> >
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> > > ÃÂ
> >
> > > Marty
> >
> > > I have one spare set of Panel Rev E (latest version)
> > at home. You can contact me off list.
> >
> > > Lin
> >
> > >
> >
> > > --- In spectrumanalyzer@yahoogroups.com,
> > "Martin" <martin.driscoll@> wrote:

> >
> > > >
> >
> > > > Hi All
> >
> > > >
> >
> > > > I am interested in purchasing a set of the
> > latest revision boards.
> >
> > > >
> >
> > > > The price of the boards through ExpressPCB is
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> >
> > > >
> >
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> > > >
> >
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> >
> > > >
> >
> > > > Regards
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> > > >
> >
> > > > Marty
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8340. Re: [spectrumanalyzer] Another spectrum analyzer idea to reduce the RF circuitry

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 14:18:08 UTC
From: William Dillon
Topic: 8312 Message: 8340

Hi Scotty,

I am more conscious of the trade-offs between analog and digital analyzers every day... I've been looking around for a SA at work, there is a huge gulf in the spec's between them. The ATTEN 6011 is a good example of a low-cost and low-spec'd digital analyzer. However, my suggestion is only intended as an addition to the already functioning MSA/VNA. I would love to be able to perform all the same calibrated analysis that is possible, but also tune into signals and demodulate them. I think that would be really, really cool. That's really the idea behind my suggestion. I'm working on this idea in my spare, spare time. There's even less of that than my spare time, so I don't see anything happening too soon with it, but I'll let people know if I get anywhere.

- Will

On Aug 4, 2011, at 6:16 AM, william sprowls wrote:

> Hi William and All,
> First off, I don't consider discussions of any spectrum analyzer system "rambling". This is probably a good place to bring up ideas.
> Here is my two cents worth:
> There are two categories of SA's, analog and digital. Analogs have simple topologies but require significant attention to layouts, crosstalk, interference, spurious, etc. Digital topologies seem even simpler, but are deceiving due to the software required to make them work.
> I can assure you that the conception and design of the MSA was not done without knowledge of DSP techniques. My goal was a high quality, yet inexpensive spectrum analyzer. In 2000, DSP was cumbersome and very expensive. Not conducive to home construction. Now, in 2011, it is much simpler and very affordable. However, the software is no less extensive. I can safely say that it would be impossible using Liberty Basic. For this reason I have no plans to convert or retrofit the MSA into a DSP environment.
> With that said, there is good reason for group members to support anyone who would like to pursue a DSP based analyzer.
> Scotty
>
> --- On Thu, 8/4/11, William Dillon <hpux735@...> wrote:
>
> > From: William Dillon <hpux735@...>
> > Subject: Re: [spectrumanalyzer] Another spectrum analyzer idea to reduce the RF circuitry
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Thursday, August 4, 2011, 12:20 AM
> > I've been considering this also.
> >
> > My current line of thinking (I will try with my kit when it
> > gets working well enough) is to split the signal coming from

> > the log detector to the phase detector (should be the 10.7
> > Mhz IF with constant amplitude) and install a off-the-shelf
> > SDR (software defined radio) kit. Many of these work
> > quite well at 10Mhz. The idea is that they
> > down-convert this IF (using sampling) to DC. The I and
> > Q (in phase and 90 degrees out of phase) can be used to
> > demodulate any signals present. The limitation of this
> > system is the bandwidth of the output. Typically,
> > people plug these into sound cards, setting the bandwidth at
> > 48kHz (before anyone invokes nyquist, you get the full
> > bandwidth because there is an I and Q). It is a good
> > idea to low-pass filter the baseband to ensure that you
> > don't get aliasing from higher frequencies. I've also
> > considered a design with a 2 M sample/second ADC with a USB
> > full-speed interface, but that's way out there.
> >
> > Anyway, sorry for the ramble.
> >
> > On Aug 3, 2011, at 12:36 AM, Weddig, Henning-Christof
> > wrote:
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> > > this is what in modern spectrunm analysers is
> > happening!
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> > > Am 03.08.2011 03:54, schrieb Amos Ku:
> > >> I have been thinking about using DSP techniques to
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> > spectrumanalyzer-fullfeatured@yahoogroups.com

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8341. Re: [spectrumanalyzer] Another spectrum analyzer idea to reduce the RF circuitry

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 14:26:45 UTC
From: Jim Hontoria
Topic: 8312 Message: 8341

Beauty is in the path o get there, more than the destination.
JIm

On Thu, Aug 4, 2011 at 10:18 AM, William Dillon <hpux735@...> wrote:

> **
>
>
> Hi Scotty,
>
> I am more conscious of the trade-offs between analog and digital analyzers
> every day... I've been looking around for a SA at work, there is a huge
> gulf in the spec's between them. The ATTEN 6011 is a good example of a
> low-cost and low-spec'd digital analyzer. However, my suggestion is only
> intended as an addition to the already functioning MSA/VNA. I would love to
> be able to perform all the same calibrated analysis that is possible, but
> also tune into signals and demodulate them. I think that would be really,
> really cool. That's really the idea behind my suggestion. I'm working on
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> time, so I don't see anything happening too soon with it, but I'll let
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> - Will
>
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>
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> reason I have no plans to convert or retrofit the MSA into a DSP
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> With that said, there is good reason for group members to support anyone
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Jim G. Hontoria

8342. Re: [spectrumanalyzer] Another spectrum analyzer idea to reduce the RF circuitry

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 14:28:30 UTC
From: Dan Andersson
Topic: 8312 Message: 8342

Will,

The cheapest and fastest way to achieve demodulation etc, is to use a SDR setup on the SA output so you can display the demodulated signal on a PC.

I would expect a Linux box with GnuRadio to be the most flexible alternative or why not just use any of the available SDR softwares.

Most digital SA's that fit in a non-defense sized wallet "should be avoided" - bad use of wording but still, if you do hi tech work where you really need to know what you see is true.

It's cheaper to achieve that with an analog SA, at least for now.

There is a reason Agilent et Al charges the prices they do.

//Dan, M0DFI

On Thursday 04 August 2011 15:18:08 you wrote:
> Hi Scotty,
>
> I am more conscious of the trade-offs between analog and digital analyzers
> every day... I've been looking around for a SA at work, there is a huge
> gulf in the spec's between them. The ATTEN 6011 is a good example of a
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> > > Anyway, sorry for the ramble.
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> > > spectrumanalyzer-fullfeatured@yahoogroups.com

8343. Re: Another spectrum analyzer idea to reduce the RF circuitry

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 15:05:18 UTC
From: inlinebeginner
Topic: 8312 Message: 8343

I agree with Jim. SDR is an interesting topic that we might want to try. Several companies already have the SOC contains the L band tuner with SDR, it capture the whole band and create multi digital tuners.
Lin
--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
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> Beauty is in the path o get there, more than the destination.
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> On Thu, Aug 4, 2011 at 10:18 AM, William Dillon <hpux735@...> wrote:
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> > Hi Scotty,
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> > I am more conscious of the trade-offs between analog and digital analyzers
> > every day... I've been looking around for a SA at work, there is a huge
> > gulf in the spec's between them. The ATTEN 6011 is a good example of a
> > low-cost and low-spec'd digital analyzer. However, my suggestion is only
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> > be able to perform all the same calibrated analysis that is possible, but
> > also tune into signals and demodulate them. I think that would be really,
> > really cool. That's really the idea behind my suggestion. I'm working on
> > this idea in my spare, spare time. There's even less of that than my spare
> > time, so I don't see anything happening too soon with it, but I'll let
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> > On Aug 4, 2011, at 6:16 AM, william sprowls wrote:
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> > inexpensive spectrum analyzer. In 2000, DSP was cumbersome and very

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> > > Subject: Re: [spectrumanalyzer] Another spectrum analyzer idea to reduce
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8344. Re: [spectrumanalyzer] Re: Another spectrum analyzer idea to reduce the RF circuitry

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 16:34:35 UTC
From: Robert Fish
Topic: 8312 Message: 8344

Hi Guys,
I too have thought about how cool it would be to have a 0 to 3GHZ general coverage receiver using the IF out of the SA. When I was a bench tech, I used to use an HP spectrum analyzer to listen to the radio while I was working on other things.
My boss used to compliment me on my using the worlds most expensive AM radio. (I am not sure it was a compliment)
To use SDR, you would need two applications running at once on your PC, no biggie of course, but you would have to change screens to change frequency or filters, audio level etc.
If you don't absolutely have to have all those fancy DSP filters and just want to demodulate what you see on your SA. There may be an analog solution as well . Something like this might do the job.

http://www.kangaus.com/micror2.htm

It could be a tabletop, single board, back end for your SA/general coverage receiver. A few minor component changes to move the receive frequency from 7MHZ to 10.7MHZ. It can also be made to demodulate AM, Narrow band FM or the CW/SSB it is designed for currently. These Direct conversion receivers designed by Rick Campbell have a reputation for superb audio and high performance. He was one of the authors of "Experimental Methods In RF Design" a very popular book amongst homebrewers. A whole chapter or two is dedicated to this type of DC receiver. A google rearch for Rick Campbell KK7B should return documentation of several of these type of receivers that he has designed. Not being an engineer, I am probably overlooking some difficulties in using this setup. but maybe it's as simple as it looks.

Have Fun,

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8345. Re: [spectrumanalyzer] Re: Another spectrum analyzer idea to reduce the RF circuitry

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 16:38:07 UTC
From: Robert Fish
Topic: 8312 Message: 8345

Hi Guys,
I too have thought about how cool it would be to have a 0 to 3GHZ general coverage receiver using the IF out of the SA. When I was a bench tech, I used to use an HP spectrum analyzer to listen to the radio while I was working on other things.
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Have Fun,

Bob

8346. Re: [spectrumanalyzer] replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 22:27:09 UTC
From: Amos Ku
Topic: 8303 Message: 8346

Look at what I have just found:

http://www.jpier.org/PIER/pier78/25.07091401.Hasan.N.pdf.

The title of this article is:
NOVEL MICROSTRIP HAIRPINLINE NARROWBAND BANDPASS FILTER USING VIA GROUND HOLES.
 Wow! If I can tune this filter to that of the coaxial cavity filter. I can greatly reduce the room for a coaxial cavity filter!

From: Berndt Josef Wulf <wulf@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Tuesday, August 2, 2011 10:24 PM
Subject: Re: [spectrumanalyzer] replacement to coaxial cavity filter

G'day Amos,

No partnumbers, but some models are listed below.

ARC Cessna RT359A
Collins TDR-950
King Radio KT76, KT76A, KT78
Narco AT50A, AT150

These are the more common models found in general avionation.

Most require modifications such fitting suitable connectors, removal of mixer diode etc, but all this is relatively straight forward.

73, Berndt
VK5ABN

On Wed, 3 Aug 2011 14:22:08 you wrote:
> Cheerio Berndt,
>
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> I am not familiar with avionics IFF transponders.
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> Would you please give me a hint on with filters, such as part number,
> website...?
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> From: Berndt Josef Wulf <wulf@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Tuesday, August 2, 2011 7:45 PM
> Subject: Re: [spectrumanalyzer] replacement to coaxial cavity filter
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> > To: spectrumanalyzer@yahoogroups.com
> > Sent: Tuesday, August 2, 2011 6:31 PM
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> > Hi Amos,
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> > adequate for a 10.7MHz second IF I increased this to 96MHz.
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> > digitally.

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> > The front end closely follows Scotty's original design. You can find more
> > details regarding the design here:
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> > > Hi,
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> > > I am thinking to build a even smaller kind of everything-in-it version
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> > > Not very fruitful so far.
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> > > Has any long-timer and experienced RF engineers in the group here
> > > thought about this question and found something useful? Would you
> > > please share with me your experience?

8347. Re: [spectrumanalyzer] replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 22:34:12 UTC
From: Amos Ku
Topic: 8303 Message: 8347

One question:

I am not very sure what the definition of 2MHz bandwidth for the coaxial cavity filter is. Usually, people define bandwidth as defined at -3dB points. It looks like that is what this coaxial cavity filter requirement is about. However, what is the requirement for the other parts of the pass band? It looks like the decay rate is going very sharp. But how sharp the filter should be in order to do sufficiently good image rejection that we discussed?

From: Berndt Josef Wulf <wulf@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Tuesday, August 2, 2011 10:24 PM
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8348. Re: [spectrumanalyzer] replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 23:08:15 UTC
From: Dan Andersson
Topic: 8303 Message: 8348

Amos,

The article you refer to is nothing new. Look for an article from 1st quarter 1989 "How To Build a Stripline Filter". It's stored at www.hparchive.com

Normally, a 1GHz stripline filter is rather large. But by grounding the endstubs, you almost half the frequency of the filter without any other changes.

If you don't have the article, mail me directly. This artcle gives the math for the filter design so you can't really miss.

The grounded stripline filter is less susceptive to detune when mounted in a metal box. The open stripline filter is more sensitive to environmental capacitances.

USE ONLY 0.8mm FR4.

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8349. Re: replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 23:43:21 UTC
From: Sam
Topic: 8303 Message: 8349

Interesting stuff. The article is at:
<http://www.hparchive.com/Bench_Briefs/HP-Bench-Briefs-1989-01-03.pdf>
Seems to be fairly broad-bandwidth, though.
Sam W.

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> 1989 "How To Build a Stripline Filter". It's stored at www.hparchive.com
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8350. Re: [spectrumanalyzer] Re: replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-04 23:57:04 UTC
From: Amos Ku
Topic: 8303 Message: 8350

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From: Sam <swetterlin@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Thursday, August 4, 2011 4:43 PM
Subject: [spectrumanalyzer] Re: replacement to coaxial cavity filter

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8351. Re: [spectrumanalyzer] Re: replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-05 10:59:49 UTC
From: Jim Hontoria
Topic: 8303 Message: 8351

Keep on Amos. That microstrip research paper that you unearthed
looks promissing.
Certainly is not a rehash and being published in 2008 is not "old stuff".

Jim W1JGH

On Thu, Aug 4, 2011 at 7:57 PM, Amos Ku <amosku@yahoo.com> wrote:

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Jim G. Hontoria

8352. Re: replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-05 13:55:34 UTC
From: inlinebeginner
Topic: 8303 Message: 8352

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Adding one more mix/PLO into current MSA, may not cost much. A combo IC (of mixer, PLL, VCO) RFFC2071 only cost less than $30, with at least 90dB phase noise.
If we use HP8558's IF2 number, 301.4MHz, the cavity filter transient band can be 602.8MHz, I think it is possible to implement this number in a 1013.7MHz LPF or BPF microstrip line filte or we can use other filters in casecade.

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Date: 2011-08-05 14:16:17 UTC
From: Dan Andersson
Topic: 8303 Message: 8353

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This is not always the case with stripline filters.

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> > > > > Sent: Tuesday, August 2, 2011 10:24 PM
> > > > > Subject: Re: [spectrumanalyzer] replacement to coaxial cavity
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> > > > >
> > > > > No partnumbers, but some models are listed below.
> > > > >
> > > > > ARC Cessna RT359A
> > > > > Collins TDR-950
> > > > > King Radio KT76, KT76A, KT78
> > > > > Narco AT50A, AT150
> > > > >
> > > > > These are the more common models found in general avionation.

> > > > >
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> > > > >
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> > > > > > > Regards
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> > > > > > > > everything-in-it version of the wonderful spectrum analyzer
> > > > > > > > (USB based. Software written in C/C++ instead of Liberty
> > > > > > > > Basic, compact..), and I am doing researches on the
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> > > > > > >
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> > > > > > > >
> > > > > > > > 3. Searched research papers in components substituting
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> > > > > > > > Has any long-timer and experienced RF engineers in the group
> > > > > > > > here thought about this question and found something useful?
> > > > > > > > Would you please share with me your experience?

8354. Re: replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-05 17:42:59 UTC
From: inlinebeginner
Topic: 8303 Message: 8354

If you look at Digikey, under ceramic filter, you can found this:
http://media.digikey.com/pdf/Data%20Sheets/CTS%20Corporation%20PDFs/KFF6402A.pdf

center frequency 1.09G , 6MHz BW, 45dB rejection at +45MHz. 2 dB insertion loss;
If we can use 3 in cascade, the insertion loss would be the same as current cavity filter, while the rejection at 40MHz should be 80dB or higher. The BW would drop to 4 or 3MHz, similar to curren cavity filter (2MHz).
The advantage: small size 34x8 mm each; if we can use 25MHz crystal filter as IF2.
Disadvantage: Expensive $50 each.

What we are discussing is only for SA, a portable SA, not including the VNA.

Lin

--- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:
>
> Lin,
>
> Cascading is fine as long as the insertion loss is low.
> This is not always the case with stripline filters.
>
> //Dan, M0DFI
>
> On Friday 05 August 2011 14:55:34 you wrote:
> > I like what Amos is doing. To make the impossible to be possible, we really
> > need this kind of topic and brainstorm. Even we fail we still could learn
> > a lot from his tries. The cavity filter's transient band has to be less
> > than 2*IF2 (about 21.4MHz for a 10.7MHz RBW filter) and the rejection at
> > +2*IF2 (off center freq) needs about 80 to 105dB, as Sam said. This
> > requirement seems to be very critical for a microstripline filter, but we
> > still can try how small its transient band can be. Once we have that
> > number, we might want to add one more IF between IF1 to IF2 (maybe we can
> > call it IF1a). If we look at the structure of early HP 8558B, a 1.5G SA,
> > it has IF1=2050MHz, IF2=301.4 and IF3=21.4MHz. The reason it uses IF2=
> > 301.4MHz might be just to provide a wider transient band for cavity filter
> > and get better image frequency rejection for mixer2. Once the frequency is
> > dropped to 301.4MHz, the mixer3's image freq rejection becomes easier. i.e
> > a 301.4MHz LPF or BPF can be much easier to implement a transient band of
> > 2*21.4=42.8MHz than a 2050MHz filter. Adding one more mix/PLO into current
> > MSA, may not cost much. A combo IC (of mixer, PLL, VCO) RFFC2071 only cost
> > less than $30, with at least 90dB phase noise. If we use HP8558's IF2
> > number, 301.4MHz, the cavity filter transient band can be 602.8MHz, I
> > think it is possible to implement this number in a 1013.7MHz LPF or BPF
> > microstrip line filte or we can use other filters in casecade.
> >
> > Thanks

> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@> wrote:
> > > Keep on Amos. That microstrip research paper that you unearthed
> > > looks promissing.
> > > Certainly is not a rehash and being published in 2008 is not "old stuff".
> > >
> > > Jim W1JGH
> > >
> > > On Thu, Aug 4, 2011 at 7:57 PM, Amos Ku <amosku@> wrote:
> > > > **
> > > >
> > > >
> > > > Thanks.
> > > >
> > > > I am not trying to persuade anyone to deviate from Scotty's design. His
> > > > design is wonderful and inexpensive. This is very good for the
> > > > hobbyists like people in this group.
> > > >
> > > > I am just trying to be a little out-of-ordinarily ambitious and trying
> > > > everything I can to push the final design of mine close to the
> > > > professional level, while maintain the simplicity of original design
> > > > idea.
> > > >
> > > > As I can see, many things can be done to improve the entire design. I
> > > > am just starting to try out different things.
> > > >
> > > >
> > > > Amos
> > > >
> > > > ---
> > > > *From:* Sam <swetterlin@>
> > > > *To:* spectrumanalyzer@yahoogroups.com
> > > > *Sent:* Thursday, August 4, 2011 4:43 PM
> > > > *Subject:* [spectrumanalyzer] Re: replacement to coaxial cavity filter
> > > >
> > > >
> > > > Interesting stuff. The article is at:
> > > > <http://www.hparchive.com/Bench_Briefs/HP-Bench-Briefs-1989-01-03.pdf>
> > > > Seems to be fairly broad-bandwidth, though.
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@> wrote:
> > > > > Amos,
> > > > >
> > > > > The article you refer to is nothing new. Look for an article from 1st
> > > >
> > > > quarter
> > > >
> > > > > 1989 "How To Build a Stripline Filter". It's stored at

> > > > > www.hparchive.com
> > > > >
> > > > > Normally, a 1GHz stripline filter is rather large. But by grounding
> > > > > the endstubs, you almost half the frequency of the filter without
> > > > > any other changes.
> > > > >
> > > > > If you don't have the article, mail me directly. This artcle gives
> > > > > the
> > > > >
> > > > > math
> > > > >
> > > > > for the filter design so you can't really miss.
> > > > >
> > > > > The grounded stripline filter is less susceptive to detune when
> > > > > mounted
> > > > >
> > > > > in a
> > > > >
> > > > > metal box. The open stripline filter is more sensitive to
> > > > > environmental capacitances.
> > > > >
> > > > > USE ONLY 0.8mm FR4.
> > > > >
> > > > > Rogers and alikes is a Royal waste of money for only 1GHz, save it
> > > > > for 3+
> > > > >
> > > > > GHz.
> > > > >
> > > > > Do not use 1.0 or 1.5mm FR4. If you only have 1.5mm, don't really
> > > > > bother
> > > > >
> > > > > as
> > > > >
> > > > > even 1GHz is a border case.
> > > > >
> > > > > You really have to mount the filters in proper boxes!
> > > > >
> > > > > Another good article is "The Design, Fabrication and Measurement of
> > > > >
> > > > > Microstrip
> > > > >
> > > > > Filter and Coupler Circuits" by Dana Brady at CA Wireless, Inc.
> > > > > It was published in July 2002 "High Frequency Electronics" and is
> > > > >
> > > > > Copyrighted
> > > > >
> > > > > 2002 by Sumit Technical Media, LLC
> > > > >
> > > > >
> > > > > Many articles refer to Agilent ADS. It's a nice piece of software but

> > > > > for
> > > >
> > > > most
> > > >
> > > > > applications, you can use QUCS instead. The layouit and syntax is
> > > > > almost
> > > >
> > > > 100%
> > > >
> > > > > equal to ADS but it's free and open source. QUCS is available both on
> > > >
> > > > Linux
> > > >
> > > > > and on Windooze.
> > > > >
> > > > > Again, I have both articles but will not drop them to the group. You
> > > > > need
> > > >
> > > > tp
> > > >
> > > > > email me directly for a non-commercial priavte copy.
> > > > > (One day it might be me or you that creates something we want to
> > > >
> > > > copyright,
> > > >
> > > > > so let us respect theirs)
> > > > >
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8355. Re: [spectrumanalyzer] Re: replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-05 17:51:04 UTC
From: Dan Andersson
Topic: 8303 Message: 8355

Check the file "Recipes_for_Printed_Hairpin_Filters.pdf"

I just started the math on a 1013MHz hairpin filter.

I hope to have it ready for PCB fab in an hour or so unless it's to cold and dark in my garage. I'll make the CAM file and mill the PCB today or tomorrow. That should be a starting point as I can just push another button for more than 1 filter.

//Dan, M0DFI

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> > On Friday 05 August 2011 14:55:34 you wrote:
> > > I like what Amos is doing. To make the impossible to be possible, we
> > > really need this kind of topic and brainstorm. Even we fail we still
> > > could learn a lot from his tries. The cavity filter's transient band
> > > has to be less than 2*IF2 (about 21.4MHz for a 10.7MHz RBW filter) and
> > > the rejection at +2*IF2 (off center freq) needs about 80 to 105dB, as
> > > Sam said. This requirement seems to be very critical for a
> > > microstripline filter, but we still can try how small its transient
> > > band can be. Once we have that number, we might want to add one more
> > > IF between IF1 to IF2 (maybe we can call it IF1a). If we look at the

> > > structure of early HP 8558B, a 1.5G SA, it has IF1=2050MHz, IF2=301.4
> > > and IF3=21.4MHz. The reason it uses IF2= 301.4MHz might be just to
> > > provide a wider transient band for cavity filter and get better image
> > > frequency rejection for mixer2. Once the frequency is dropped to
> > > 301.4MHz, the mixer3's image freq rejection becomes easier. i.e a
> > > 301.4MHz LPF or BPF can be much easier to implement a transient band
> > > of 2*21.4=42.8MHz than a 2050MHz filter. Adding one more mix/PLO into
> > > current MSA, may not cost much. A combo IC (of mixer, PLL, VCO)
> > > RFFC2071 only cost less than $30, with at least 90dB phase noise. If
> > > we use HP8558's IF2 number, 301.4MHz, the cavity filter transient band
> > > can be 602.8MHz, I think it is possible to implement this number in a
> > > 1013.7MHz LPF or BPF microstrip line filte or we can use other filters
> > > in casecade.
> > >
> > > Thanks
> > > Lin
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@> wrote:
> > > > Keep on Amos. That microstrip research paper that you unearthed
> > > > looks promissing.
> > > > Certainly is not a rehash and being published in 2008 is not "old
> > > > stuff".
> > > >
> > > > Jim W1JGH
> > > >
> > > > On Thu, Aug 4, 2011 at 7:57 PM, Amos Ku <amosku@> wrote:
> > > > > **
> > > > >
> > > > >
> > > > > Thanks.
> > > > >
> > > > > I am not trying to persuade anyone to deviate from Scotty's design.
> > > > > His design is wonderful and inexpensive. This is very good for the
> > > > > hobbyists like people in this group.
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> > > > > I am just trying to be a little out-of-ordinarily ambitious and
> > > > > trying everything I can to push the final design of mine close to
> > > > > the professional level, while maintain the simplicity of original
> > > > > design idea.
> > > > >
> > > > > As I can see, many things can be done to improve the entire design.
> > > > > I am just starting to try out different things.
> > > > >
> > > > >
> > > > > Amos
> > > > >
> > > > > ---
> > > > > *From:* Sam <swetterlin@>
> > > > > *To:* spectrumanalyzer@yahoogroups.com
> > > > > *Sent:* Thursday, August 4, 2011 4:43 PM

> > > > > *Subject:* [spectrumanalyzer] Re: replacement to coaxial cavity
> > > > > filter
> > > > >
> > > > >
> > > > > Interesting stuff. The article is at:
> > > > > <http://www.hparchive.com/Bench_Briefs/HP-Bench-Briefs-1989-01-03.p
> > > > > df> Seems to be fairly broad-bandwidth, though.
> > > > > Sam W.
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@> wrote:
> > > > > > Amos,
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> > > > > > The article you refer to is nothing new. Look for an article from
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> > > > >
> > > > > > 1989 "How To Build a Stripline Filter". It's stored at
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> > > > > > Normally, a 1GHz stripline filter is rather large. But by
> > > > > > grounding the endstubs, you almost half the frequency of the
> > > > > > filter without any other changes.
> > > > > >
> > > > > > If you don't have the article, mail me directly. This artcle
> > > > > > gives the
> > > > >
> > > > > math
> > > > >
> > > > > > for the filter design so you can't really miss.
> > > > > >
> > > > > > The grounded stripline filter is less susceptive to detune when
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> > > > >
> > > > > in a
> > > > >
> > > > > > metal box. The open stripline filter is more sensitive to
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> > > > > >
> > > > > > USE ONLY 0.8mm FR4.
> > > > > >
> > > > > > Rogers and alikes is a Royal waste of money for only 1GHz, save
> > > > > > it for 3+
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> > > > >
> > > > > > Do not use 1.0 or 1.5mm FR4. If you only have 1.5mm, don't really
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> > > > >
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> > > > >
> > > > > > even 1GHz is a border case.
> > > > > >
> > > > > > You really have to mount the filters in proper boxes!
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> > > > > > Another good article is "The Design, Fabrication and Measurement
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> > > > > Microstrip
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> > > > > > Filter and Coupler Circuits" by Dana Brady at CA Wireless, Inc.
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> > > > > Copyrighted
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> > > > > > 2002 by Sumit Technical Media, LLC
> > > > > >
> > > > > >
> > > > > > Many articles refer to Agilent ADS. It's a nice piece of software
> > > > > > but for
> > > > >
> > > > > most
> > > > >
> > > > > > applications, you can use QUCS instead. The layouit and syntax is
> > > > > > almost
> > > > >
> > > > > 100%
> > > > >
> > > > > > equal to ADS but it's free and open source. QUCS is available
> > > > > > both on
> > > > >
> > > > > Linux
> > > > >
> > > > > > and on Windooze.
> > > > > >
> > > > > > Again, I have both articles but will not drop them to the group.
> > > > > > You need
> > > > >
> > > > > tp
> > > > >
> > > > > > email me directly for a non-commercial priavte copy.
> > > > > > (One day it might be me or you that creates something we want to
> > > > >
> > > > > copyright,
> > > > >
> > > > > > so let us respect theirs)
> > > > > >
> > > > > >
> > > > > >
> > > > > > //Dan, M0DFI

> > > > > >
> > > > > > On Thursday 04 August 2011 23:27:09 you wrote:
> > > > > > > Look at what I have just found:
> > > > > > >
> > > > > > > http://www.jpier.org/PIER/pier78/25.07091401.Hasan.N.pdf.
> > > > > > >
> > > > > > > The title of this article is:
> > > > > > > NOVEL MICROSTRIP HAIRPINLINE NARROWBAND BANDPASS FILTER USING
> > > > > > > VIA
> > > > > >
> > > > > GROUND
> > > > > >
> > > > > > > HOLES. Wow! If I can tune this filter to that of the coaxial
> > > > > > > cavity filter. I can greatly reduce the room for a coaxial
> > > > > > > cavity filter!
> > > > > > >
> > > > > > >
> > > > > > >
> > > > > > >
> > > > > > > _____
> > > > > > > From: Berndt Josef Wulf <wulf@>
> > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > Sent: Tuesday, August 2, 2011 10:24 PM
> > > > > > > Subject: Re: [spectrumanalyzer] replacement to coaxial cavity
> > > > > > > filter
> > > > > > >
> > > > > > >
> > > > > > >
> > > > > > > G'day Amos,
> > > > > > >
> > > > > > > No partnumbers, but some models are listed below.
> > > > > > >
> > > > > > > ARC Cessna RT359A
> > > > > > > Collins TDR-950
> > > > > > > King Radio KT76, KT76A, KT78
> > > > > > > Narco AT50A, AT150
> > > > > > >
> > > > > > > These are the more common models found in general avionation.
> > > > > > >
> > > > > > > Most require modifications such fitting suitable connectors,
> > > > > > > removal of mixer diode etc, but all this is relatively straight
> > > > > > > forward.
> > > > > > >
> > > > > > > 73, Berndt
> > > > > > > VK5ABN
> > > > > > >
> > > > > > > On Wed, 3 Aug 2011 14:22:08 you wrote:
> > > > > > > > Cheerio Berndt,
> > > > > > >
> > > > > > >

> > > > > > > > I am not familiar with avionics IFF transponders.
> > > > > > > >
> > > > > > > >
> > > > > > > > Would you please give me a hint on with filters, such as part
> > > > > > > > number, website...?
> > > > > > > >
> > > > > > > >
> > > > > > > > Amos
> > > > > > > >
> > > > > > > >
> > > > > > > >
> > > > > > > > _____
> > > > > > > > From: Berndt Josef Wulf <wulf@>
> > > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > > Sent: Tuesday, August 2, 2011 7:45 PM
> > > > > > > > Subject: Re: [spectrumanalyzer] replacement to coaxial cavity
> > > > > > > > filter
> > > > > > > >
> > > > > > > >
> > > > > > > >
> > > > > > > > G'day,
> > > > > > > >
> > > > > > > > an alternative to the home built coaxial cavity filter is to
> > > > > > > > use
> > > > > >
> > > > > > filters
> > > > >
> > > > > > > > from avionics IFF transponders. I've retuned a filter and was
> > > > > > > > able to
> > > > > >
> > > > > > get
> > > > >
> > > > > > > > it within specifications.
> > > > > > > >
> > > > > > > > cheerio Berndt
> > > > > > > >
> > > > > > > > On Wed, 3 Aug 2011 11:19:15 you wrote:
> > > > > > > > > Phil,
> > > > > > > >
> > > > > > > > Thanks. That is a good news. I believe the cavity filter
> > > > > > > > must be a
> > > > > >
> > > > > > good
> > > > >
> > > > > > > > stuff but I really cannot have gigantic boxes in my garage.
> > > > > > > > I just
> > > > > >
> > > > > > do
> > > > >
> > > > > > > > not have room.

> > > > > > > > >
> > > > > > > > >
> > > > > > > > > > Amos
> > > > > > > > >
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > > _____
> > > > > > > > > > From: Phil Harman <phil@>
> > > > > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > > > > Sent: Tuesday, August 2, 2011 6:31 PM
> > > > > > > > > > Subject: Re: [spectrumanalyzer] replacement to coaxial
> > > > > > > > > > cavity
> > > > > >
> > > > > > filter
> > > > > >
> > > > > > > > > > Hi Amos,
> > > > > > > > > >
> > > > > > > > > > I have had success with an alternative to a cavity filter.
> > > > > > > > > > I use a couple of TOKO 6DFC 1.030GHz Dielectric filters.
> > > > > > > > > >
> > > > > > > > > > Since the skirt selectivity, even with two cascaded
> > > > > > > > > > filters, is not adequate for a 10.7MHz second IF I
> > > > > > > > > > increased this to 96MHz.
> > > > > > > > > >
> > > > > > > > > > There are a number of low cost and high performance SAW
> > > > > > > > > > filters available at 96MHz and I used an RFM SF2135A.
> > > > > > > > >
> > > > > > > > > > You could then further mix this to 10.7MHz - in my case I
> > > > > > > > > > used an
> > > > > >
> > > > > > ADC
> > > > > >
> > > > > > > > > > on its first alias to directly digitise the 96MHz IF and
> > > > > > > > > > did the filtering digitally.
> > > > > > > > >
> > > > > > > > > > The front end closely follows Scotty's original design. You
> > > > > > > > > > can
> > > > > >
> > > > > > find
> > > > > >
> > > > > > > > > > more details regarding the design here:
> > > > > > > > >
> > > > > > > > > > <http://openhpsdr.org/wiki/index.php?title=CYCLOPS>
> > > > > > > > >
> > > > > > > > > > The project has stalled for a number of years due to work
> > > > > > > > > > on other projects and a problem with high noise sidebands
> > > > > > > > > > on the two local oscillators. However, we have recently
> > > > > > > > > > re-started to project and appear to have found the cause
> > > > > > > > > > of the noise.
> > > > > > > > >

> > > > > > > > > In any case there is no problem with either the Dielectric
> > > > > > > > > > or SAW filters.
> > > > > > > > > >
> > > > > > > > > > Regards
> > > > > > > > > >
> > > > > > > > > > Phil...VK6APH
> > > > > > > > > >
> > > > > > > > > > > Hi,
> > > > > > > > > > >
> > > > > > > > > > > I am new here, but I am kind of innovative type.
> > > > > > > > > > >
> > > > > > > > > > > I am thinking to build a even smaller kind of
> > > > > > > > > > > everything-in-it version of the wonderful spectrum
> > > > > > > > > > > analyzer (USB based. Software written in C/C++ instead
> > > > > > > > > > > of Liberty Basic, compact..), and I am doing researches
> > > > > > > > > > > on the possibilities and ways to realize my ambitions.
> > > > > > > > > > >
> > > > > > > > > > > Hopefully, my ambition does not seem too radical...
> > > > > > > > > > >
> > > > > > > > > > > Looking briefly at the project, I think that replacing
> > > > > > > > > > > coaxial
> > > > > > > >
> > > > > > > > cavity
> > > > > > > >
> > > > > > > > > > > filter may help reducing the entire volume quite a bit.
> > > > > > > > > > > Searching online for bit, do not seem to find any good
> > > > > > > > > > > substitutes. These
> > > > > > > >
> > > > > > > > are
> > > > > > > >
> > > > > > > > > > > what I have researched and tried:
> > > > > > > > > > >
> > > > > > > > > > > 1. Try to find a pair of high pass filter and low pass
> > > > > > > > > > > filter.
> > > > > > > >
> > > > > > > > But
> > > > > > > >
> > > > > > > > > > > nothing can get closer to 2MHz pass band. The closet
> > > > > > > > > > > match now is 20MHz.
> > > > > > > > > > >
> > > > > > > > > > > 2. My RF friend suggested using RF resonantor. Do not
> > > > > > > > > > > know how to design one yet.
> > > > > > > > > > >
> > > > > > > > > > > 3. Searched research papers in components substituting
> > > > > > > > > > > coaxial cavity. Not very fruitful so far.
> > > > > > > > > > >
> > > > > > > > > > > Has any long-timer and experienced RF engineers in the
> > > > > > > > > > > group here thought about this question and found
> > > > > > > > > > > something useful? Would you please share with me your
> > > > > > > > > > > experience?

8356. Re: [spectrumanalyzer] Re: replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-05 17:52:59 UTC
From: Amos Ku
Topic: 8303 Message: 8356

Wow! What a good news! See what technological advances can help to improve the life of our hobbyists.

Lin,

Thank you very much for the info. Even $50 is fine for me at this point.

_____
From: inlinebeginner <inlinebeginner@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Friday, August 5, 2011 10:42 AM
Subject: [spectrumanalyzer] Re: replacement to coaxial cavity filter

If you look at Digikey, under ceramic filter, you can found this:
http://media.digikey.com/pdf/Data%20Sheets/CTS%20Corporation%20PDFs/KFF6402A.pdf

center frequency 1.09G , 6MHz BW, 45dB rejection at +45MHz. 2 dB insertion loss;
If we can use 3 in cascade, the insertion loss would be the same as current cavity filter, while the rejection at 40MHz should be 80dB or higher. The BW would drop to 4 or 3MHz, similar to curren cavity filter (2MHz).
The advantage: small size 34x8 mm each; if we can use 25MHz crystal filter as IF2.
Disadvantage: Expensive $50 each.

What we are discussing is only for SA, a portable SA, not including the VNA.

Lin

--- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:
>
> Lin,
>
> Cascading is fine as long as the insertion loss is low.
> This is not always the case with stripline filters.
>
> //Dan, M0DFI
>
> On Friday 05 August 2011 14:55:34 you wrote:
> > I like what Amos is doing. To make the impossible to be possible, we really
> > need this kind of topic and brainstorm. Even we fail we still could learn
> > a lot from his tries. The cavity filter's transient band has to be less
> > than 2*IF2 (about 21.4MHz for a 10.7MHz RBW filter) and the rejection at
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> > > >
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> > > >
> > > > > email me directly for a non-commercial priavte copy.
> > > > > > (One day it might be me or you that creates something we want to
> > > >
> > > > copyright,
> > > >
> > > > > so let us respect theirs)
> > > > > >
> > > > > >
> > > > > >
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> > > > > > From: Berndt Josef Wulf <wulf@>
> > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > Sent: Tuesday, August 2, 2011 10:24 PM
> > > > > > Subject: Re: [spectrumanalyzer] replacement to coaxial cavity
> > > > > > filter
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> > > > > > > Would you please give me a hint on with filters, such as part
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> > > > > > >
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> > > > > > To: spectrumanalyzer@yahoogroups.com
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> > > > > > Subject: Re: [spectrumanalyzer] replacement to coaxial cavity

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8357. Re: [spectrumanalyzer] replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-05 17:53:06 UTC
From: William Dillon
Topic: 8303 Message: 8357

The price is surely a significant disadvantage. The cost in parts (surely not time) for 10 cavity filters would be less than one 3-filter cascade using this part.

On Aug 5, 2011, at 10:42 AM, inlinebeginner wrote:

> If you look at Digikey, under ceramic filter, you can found this:
> http://media.digikey.com/pdf/Data%20Sheets/CTS%20Corporation%20PDFs/KFF6402A.pdf
>
> center frequency 1.09G , 6MHz BW, 45dB rejection at +45MHz. 2 dB insertion loss;
> If we can use 3 in cascade, the insertion loss would be the same as current cavity filter, while the rejection at 40MHz should be 80dB or higher. The BW would drop to 4 or 3MHz, similar to curren cavity filter (2MHz).
> The advantage: small size 34x8 mm each; if we can use 25MHz crystal filter as IF2.
> Disadvantage: Expensive $50 each.
>
> What we are discussing is only for SA, a portable SA, not including the VNA.
>
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:
> >
> > Lin,
> >
> > Cascading is fine as long as the insertion loss is low.
> > This is not always the case with stripline filters.
> >
> > //Dan, M0DFI
> >
> > On Friday 05 August 2011 14:55:34 you wrote:
> > > I like what Amos is doing. To make the impossible to be possible, we really
> > > need this kind of topic and brainstorm. Even we fail we still could learn
> > > a lot from his tries. The cavity filter's transient band has to be less
> > > than 2*IF2 (about 21.4MHz for a 10.7MHz RBW filter) and the rejection at
> > > +2*IF2 (off center freq) needs about 80 to 105dB, as Sam said. This
> > > requirement seems to be very critical for a microstripline filter, but we
> > > still can try how small its transient band can be. Once we have that
> > > number, we might want to add one more IF between IF1 to IF2 (maybe we can
> > > call it IF1a). If we look at the structure of early HP 8558B, a 1.5G SA,
> > > it has IF1=2050MHz, IF2=301.4 and IF3=21.4MHz. The reason it uses IF2=
> > > 301.4MHz might be just to provide a wider transient band for cavity filter
> > > and get better image frequency rejection for mixer2. Once the frequency is
> > > dropped to 301.4MHz, the mixer3's image freq rejection becomes easier. i.e
> > > a 301.4MHz LPF or BPF can be much easier to implement a transient band of
> > > 2*21.4=42.8MHz than a 2050MHz filter. Adding one more mix/PLO into current
> > > MSA, may not cost much. A combo IC (of mixer, PLL, VCO) RFFC2071 only cost

> > > less than $30, with at least 90dB phase noise. If we use HP8558's IF2
> > > number, 301.4MHz, the cavity filter transient band can be 602.8MHz, I
> > > think it is possible to implement this number in a 1013.7MHz LPF or BPF
> > > microstrip line filte or we can use other filters in casecade.
> > >
> > > Thanks
> > > Lin
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@> wrote:
> > > > Keep on Amos. That microstrip research paper that you unearthed
> > > > looks promissing.
> > > > Certainly is not a rehash and being published in 2008 is not "old stuff".
> > > >
> > > > Jim W1JGH
> > > >
> > > > On Thu, Aug 4, 2011 at 7:57 PM, Amos Ku <amosku@> wrote:
> > > > > **
> > > > >
> > > > >
> > > > > Thanks.
> > > > >
> > > > > I am not trying to persuade anyone to deviate from Scotty's design. His
> > > > > design is wonderful and inexpensive. This is very good for the
> > > > > hobbyists like people in this group.
> > > > >
> > > > > I am just trying to be a little out-of-ordinarily ambitious and trying
> > > > > everything I can to push the final design of mine close to the
> > > > > professional level, while maintain the simplicity of original design
> > > > > idea.
> > > > >
> > > > > As I can see, many things can be done to improve the entire design. I
> > > > > am just starting to try out different things.
> > > > >
> > > > >
> > > > > Amos
> > > > >
> > > > > ---
> > > > > *From:* Sam <swetterlin@>
> > > > > *To:* spectrumanalyzer@yahoogroups.com
> > > > > *Sent:* Thursday, August 4, 2011 4:43 PM
> > > > > *Subject:* [spectrumanalyzer] Re: replacement to coaxial cavity filter
> > > > >
> > > > >
> > > > > Interesting stuff. The article is at:
> > > > > <http://www.hparchive.com/Bench_Briefs/HP-Bench-Briefs-1989-01-03.pdf>
> > > > > Seems to be fairly broad-bandwidth, though.
> > > > > Sam W.
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@> wrote:
> > > > > > Amos,

> > > > > >
> > > > > > The article you refer to is nothing new. Look for an article from 1st
> > > > >
> > > > > quarter
> > > > >
> > > > > > 1989 "How To Build a Stripline Filter". It's stored at
> > > > > > www.hparchive.com
> > > > > >
> > > > > > Normally, a 1GHz stripline filter is rather large. But by grounding
> > > > > > the endstubs, you almost half the frequency of the filter without
> > > > > > any other changes.
> > > > > >
> > > > > > If you don't have the article, mail me directly. This artcle gives
> > > > > > the
> > > > > >
> > > > > > math
> > > > > >
> > > > > > for the filter design so you can't really miss.
> > > > > >
> > > > > > The grounded stripline filter is less susceptive to detune when
> > > > > > mounted
> > > > > >
> > > > > > in a
> > > > > >
> > > > > > metal box. The open stripline filter is more sensitive to
> > > > > > environmental capacitances.
> > > > > >
> > > > > > USE ONLY 0.8mm FR4.
> > > > > >
> > > > > > Rogers and alikes is a Royal waste of money for only 1GHz, save it
> > > > > > for 3+
> > > > > >
> > > > > > GHz.
> > > > > >
> > > > > > Do not use 1.0 or 1.5mm FR4. If you only have 1.5mm, don't really
> > > > > > bother
> > > > > >
> > > > > > as
> > > > > >
> > > > > > even 1GHz is a border case.
> > > > > >
> > > > > > You really have to mount the filters in proper boxes!
> > > > > >
> > > > > > Another good article is "The Design, Fabrication and Measurement of
> > > > > >
> > > > > > Microstrip
> > > > > >
> > > > > > Filter and Coupler Circuits" by Dana Brady at CA Wireless, Inc.
> > > > > > It was published in July 2002 "High Frequency Electronics" and is
> > > > > >

> > > > > Copyrighted
> > > > >
> > > > > > 2002 by Sumit Technical Media, LLC
> > > > > >
> > > > > >
> > > > > > Many articles refer to Agilent ADS. It's a nice piece of software but
> > > > > > for
> > > > > >
> > > > > most
> > > > > >
> > > > > > applications, you can use QUCS instead. The layouit and syntax is
> > > > > > almost
> > > > > >
> > > > > 100%
> > > > > >
> > > > > > equal to ADS but it's free and open source. QUCS is available both on
> > > > > >
> > > > > Linux
> > > > > >
> > > > > > and on Windooze.
> > > > > > >
> > > > > > Again, I have both articles but will not drop them to the group. You
> > > > > > need
> > > > > >
> > > > > tp
> > > > > >
> > > > > > email me directly for a non-commercial priavte copy.
> > > > > > (One day it might be me or you that creates something we want to
> > > > > >
> > > > > copyright,
> > > > > >
> > > > > > so let us respect theirs)
> > > > > > >
> > > > > > >
> > > > > > >
> > > > > > //Dan, M0DFI
> > > > > > >
> > > > > > On Thursday 04 August 2011 23:27:09 you wrote:
> > > > > > > Look at what I have just found:
> > > > > > >
> > > > > > > http://www.jpier.org/PIER/pier78/25.07091401.Hasan.N.pdf.
> > > > > > >
> > > > > > > The title of this article is:
> > > > > > > NOVEL MICROSTRIP HAIRPINLINE NARROWBAND BANDPASS FILTER USING VIA
> > > > > >
> > > > > GROUND
> > > > > >
> > > > > > > HOLES. Wow! If I can tune this filter to that of the coaxial cavity
> > > > > > > filter. I can greatly reduce the room for a coaxial cavity filter!
> > > > > > >

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8358. Re: [spectrumanalyzer] Re: replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-05 18:01:31 UTC
From: Amos Ku
Topic: 8303 Message: 8358

Thank you. Dan.

From: Dan Andersson <dan@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Friday, August 5, 2011 10:51 AM
Subject: Re: [spectrumanalyzer] Re: replacement to coaxial cavity filter

Check the file "Recipes_for_Printed_Hairpin_Filters.pdf"

I just started the math on a 1013MHz hairpin filter.

I hope to have it ready for PCB fab in an hour or so unless it's to cold and dark in my garage. I'll make the CAM file and mill the PCB today or tomorrow. That should be a starting point as I can just push another button for more than 1 filter.

//Dan, M0DFI

On Friday 05 August 2011 18:42:59 you wrote:
> If you look at Digikey, under ceramic filter, you can found this:
> http://media.digikey.com/pdf/Data%20Sheets/CTS%20Corporation%20PDFs/KFF6402
> A.pdf
>
> center frequency 1.09G , 6MHz BW, 45dB rejection at +45MHz. 2 dB insertion
> loss; If we can use 3 in cascade, the insertion loss would be the same as
> current cavity filter, while the rejection at 40MHz should be 80dB or
> higher. The BW would drop to 4 or 3MHz, similar to curren cavity filter
> (2MHz). The advantage: small size 34x8 mm each; if we can use 25MHz
> crystal filter as IF2. Disadvantage: Expensive $50 each.
>
> What we are discussing is only for SA, a portable SA, not including the
> VNA.
>
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:
> > Lin,
> >
> > Cascading is fine as long as the insertion loss is low.
> > This is not always the case with stripline filters.
> >
> > //Dan, M0DFI
> >
> > On Friday 05 August 2011 14:55:34 you wrote:
> > > I like what Amos is doing. To make the impossible to be possible, we

> > > really need this kind of topic and brainstorm. Even we fail we still
> > > could learn a lot from his tries. The cavity filter's transient band
> > > has to be less than 2*IF2 (about 21.4MHz for a 10.7MHz RBW filter) and
> > > the rejection at +2*IF2 (off center freq) needs about 80 to 105dB, as
> > > Sam said. This requirement seems to be very critical for a
> > > microstripline filter, but we still can try how small its transient
> > > band can be. Once we have that number, we might want to add one more
> > > IF between IF1 to IF2 (maybe we can call it IF1a). If we look at the
> > > structure of early HP 8558B, a 1.5G SA, it has IF1=2050MHz, IF2=301.4
> > > and IF3=21.4MHz. The reason it uses IF2= 301.4MHz might be just to
> > > provide a wider transient band for cavity filter and get better image
> > > frequency rejection for mixer2. Once the frequency is dropped to
> > > 301.4MHz, the mixer3's image freq rejection becomes easier. i.e a
> > > 301.4MHz LPF or BPF can be much easier to implement a transient band
> > > of 2*21.4=42.8MHz than a 2050MHz filter. Adding one more mix/PLO into
> > > current MSA, may not cost much. A combo IC (of mixer, PLL, VCO)
> > > RFFC2071 only cost less than $30, with at least 90dB phase noise. If
> > > we use HP8558's IF2 number, 301.4MHz, the cavity filter transient band
> > > can be 602.8MHz, I think it is possible to implement this number in a
> > > 1013.7MHz LPF or BPF microstrip line filte or we can use other filters
> > > in casecade.
> > >
> > > Thanks
> > > Lin
> > >
> > > --- In spectrumanalyzer@...m, Jim Hontoria <jghalpha@> wrote:
> > > > Keep on Amos. That microstrip research paper that you unearthed
> > > > looks promissing.
> > > > Certainly is not a rehash and being published in 2008 is not "old
> > > > stuff".
> > > >
> > > > Jim W1JGH
> > > >
> > > > On Thu, Aug 4, 2011 at 7:57 PM, Amos Ku <amosku@> wrote:
> > > > > **
> > > > >
> > > > >
> > > > > Thanks.
> > > > >
> > > > > I am not trying to persuade anyone to deviate from Scotty's design.
> > > > > His design is wonderful and inexpensive. This is very good for the
> > > > > hobbyists like people in this group.
> > > > >
> > > > > I am just trying to be a little out-of-ordinarily ambitious and
> > > > > trying everything I can to push the final design of mine close to
> > > > > the professional level, while maintain the simplicity of original
> > > > > design idea.
> > > > >
> > > > > As I can see, many things can be done to improve the entire design.
> > > > > I am just starting to try out different things.

> > > > >
> > > > >
> > > > > Amos
> > > > >
> > > > > ----------
> > > > > *From:* Sam <swetterlin@>
> > > > > *To:* spectrumanalyzer@yahoogroups.com
> > > > > *Sent:* Thursday, August 4, 2011 4:43 PM
> > > > > *Subject:* [spectrumanalyzer] Re: replacement to coaxial cavity
> > > > > filter
> > > > > >
> > > > > >
> > > > > Interesting stuff. The article is at:
> > > > > <http://www.hparchive.com/Bench_Briefs/HP-Bench-Briefs-1989-01-03.p
> > > > > df> Seems to be fairly broad-bandwidth, though.
> > > > > Sam W.
> > > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@> wrote:
> > > > > > Amos,
> > > > > > >
> > > > > > The article you refer to is nothing new. Look for an article from
> > > > > > 1st
> > > > > >
> > > > > quarter
> > > > > >
> > > > > > 1989 "How To Build a Stripline Filter". It's stored at
> > > > > > www.hparchive.com
> > > > > > >
> > > > > > Normally, a 1GHz stripline filter is rather large. But by
> > > > > > grounding the endstubs, you almost half the frequency of the
> > > > > > filter without any other changes.
> > > > > > >
> > > > > > If you don't have the article, mail me directly. This artcle
> > > > > > gives the
> > > > > >
> > > > > > math
> > > > > >
> > > > > > for the filter design so you can't really miss.
> > > > > > >
> > > > > > The grounded stripline filter is less susceptive to detune when
> > > > > > mounted
> > > > > >
> > > > > > in a
> > > > > >
> > > > > > metal box. The open stripline filter is more sensitive to
> > > > > > environmental capacitances.
> > > > > > >
> > > > > > USE ONLY 0.8mm FR4.
> > > > > > >
> > > > > > Rogers and alikes is a Royal waste of money for only 1GHz, save

> > > > > > it for 3+
> > > > >
> > > > > GHz.
> > > > >
> > > > > > Do not use 1.0 or 1.5mm FR4. If you only have 1.5mm, don't really
> > > > > > bother
> > > > >
> > > > > as
> > > > >
> > > > > > even 1GHz is a border case.
> > > > > >
> > > > > > You really have to mount the filters in proper boxes!
> > > > > >
> > > > > > Another good article is "The Design, Fabrication and Measurement
> > > > > > of
> > > > >
> > > > > Microstrip
> > > > >
> > > > > > Filter and Coupler Circuits" by Dana Brady at CA Wireless, Inc.
> > > > > > It was published in July 2002 "High Frequency Electronics" and is
> > > > >
> > > > > Copyrighted
> > > > >
> > > > > > 2002 by Sumit Technical Media, LLC
> > > > > >
> > > > > >
> > > > > > Many articles refer to Agilent ADS. It's a nice piece of software
> > > > > > but for
> > > > >
> > > > > most
> > > > >
> > > > > > applications, you can use QUCS instead. The layouit and syntax is
> > > > > > almost
> > > > >
> > > > > 100%
> > > > >
> > > > > > equal to ADS but it's free and open source. QUCS is available
> > > > > > both on
> > > > >
> > > > > Linux
> > > > >
> > > > > > and on Windooze.
> > > > > >
> > > > > > Again, I have both articles but will not drop them to the group.
> > > > > > You need
> > > > >
> > > > > tp
> > > > >
> > > > > > email me directly for a non-commercial priavte copy.
> > > > > > (One day it might be me or you that creates something we want to

> > > > >
> > > > > copyright,
> > > > >
> > > > > > so let us respect theirs)
> > > > > >
> > > > > >
> > > > > >
> > > > > > //Dan, M0DFI
> > > > > >
> > > > > > On Thursday 04 August 2011 23:27:09 you wrote:
> > > > > > > Look at what I have just found:
> > > > > > >
> > > > > > > http://www.jpier.org/PIER/pier78/25.07091401.Hasan.N.pdf.
> > > > > > >
> > > > > > > The title of this article is:
> > > > > > > NOVEL MICROSTRIP HAIRPINLINE NARROWBAND BANDPASS FILTER USING
> > > > > > > VIA
> > > > > >
> > > > > GROUND
> > > > > >
> > > > > > > HOLES. Wow! If I can tune this filter to that of the coaxial
> > > > > > > cavity filter. I can greatly reduce the room for a coaxial
> > > > > > > cavity filter!
> > > > > > >
> > > > > > >
> > > > > > >
> > > > > > >
> > > > > > > _____
> > > > > > > From: Berndt Josef Wulf <wulf@>
> > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > Sent: Tuesday, August 2, 2011 10:24 PM
> > > > > > > Subject: Re: [spectrumanalyzer] replacement to coaxial cavity
> > > > > > > filter
> > > > > > >
> > > > > > >
> > > > > > >
> > > > > > > G'day Amos,
> > > > > > >
> > > > > > > No partnumbers, but some models are listed below.
> > > > > > >
> > > > > > > ARC Cessna RT359A
> > > > > > > Collins TDR-950
> > > > > > > King Radio KT76, KT76A, KT78
> > > > > > > Narco AT50A, AT150
> > > > > > >
> > > > > > > These are the more common models found in general avionation.
> > > > > > >
> > > > > > > Most require modifications such fitting suitable connectors,
> > > > > > > removal of mixer diode etc, but all this is relatively straight
> > > > > > > forward.

> > > > > > >
> > > > > > > 73, Berndt
> > > > > > > VK5ABN
> > > > > > >
> > > > > > > On Wed, 3 Aug 2011 14:22:08 you wrote:
> > > > > > > > Cheerio Berndt,
> > > > > > > > >
> > > > > > > > >
> > > > > > > > I am not familiar with avionics IFF transponders.
> > > > > > > > >
> > > > > > > > >
> > > > > > > > Would you please give me a hint on with filters, such as part
> > > > > > > > number, website...?
> > > > > > > > >
> > > > > > > > >
> > > > > > > > Amos
> > > > > > > > >
> > > > > > > > >
> > > > > > > > >
> > > > > > > > _____
> > > > > > > > From: Berndt Josef Wulf <wulf@>
> > > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > > Sent: Tuesday, August 2, 2011 7:45 PM
> > > > > > > > Subject: Re: [spectrumanalyzer] replacement to coaxial cavity
> > > > > > > > filter
> > > > > > > > >
> > > > > > > > >
> > > > > > > > >
> > > > > > > > G'day,
> > > > > > > > >
> > > > > > > > an alternative to the home built coaxial cavity filter is to
> > > > > > > > use
> > > > > > >
> > > > > > filters
> > > > > >
> > > > > > > > from avionics IFF transponders. I've retuned a filter and was
> > > > > > > > able to
> > > > > > >
> > > > > > get
> > > > > >
> > > > > > > > it within specifications.
> > > > > > > > >
> > > > > > > > cheerio Berndt
> > > > > > > > >
> > > > > > > > On Wed, 3 Aug 2011 11:19:15 you wrote:
> > > > > > > > > Phil,
> > > > > > > > >
> > > > > > > > Thanks. That is a good news. I believe the cavity filter
> > > > > > > > must be a
> > > > > > >

> > > > > good
> > > > >
> > > > > > > > > stuff but I really cannot have gigantic boxes in my garage.
> > > > > > > > > I just
> > > > >
> > > > > do
> > > > >
> > > > > > > > > not have room.
> > > > > > > > >
> > > > > > > > >
> > > > > > > > > Amos
> > > > > > > > >
> > > > > > > > >
> > > > > > > > >
> > > > > > > > > _____
> > > > > > > > > From: Phil Harman <phil@>
> > > > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > > > Sent: Tuesday, August 2, 2011 6:31 PM
> > > > > > > > > Subject: Re: [spectrumanalyzer] replacement to coaxial
> > > > > > > > > cavity
> > > > > >
> > > > > > filter
> > > > > >
> > > > > > > > > Hi Amos,
> > > > > > > > >
> > > > > > > > > I have had success with an alternative to a cavity filter.
> > > > > > > > > I use a couple of TOKO 6DFC 1.030GHz Dielectric filters.
> > > > > > > > >
> > > > > > > > > Since the skirt selectivity, even with two cascaded
> > > > > > > > > filters, is not adequate for a 10.7MHz second IF I
> > > > > > > > > increased this to 96MHz.
> > > > > > > > >
> > > > > > > > > There are a number of low cost and high performance SAW
> > > > > > > > > filters available at 96MHz and I used an RFM SF2135A.
> > > > > > > > >
> > > > > > > > > You could then further mix this to 10.7MHz - in my case I
> > > > > > > > > used an
> > > > > > >
> > > > > > > ADC
> > > > > > >
> > > > > > > > > on its first alias to directly digitise the 96MHz IF and
> > > > > > > > > did the filtering digitally.
> > > > > > > > >
> > > > > > > > > The front end closely follows Scotty's original design. You
> > > > > > > > > can
> > > > > > >
> > > > > > > find
> > > > > > >
> > > > > > > > > more details regarding the design here:
> > > > > > > > >

> > > > > > > > > <http://openhpsdr.org/wiki/index.php?title=CYCLOPS>
> > > > > > > > >
> > > > > > > > > The project has stalled for a number of years due to work
> > > > > > > > > on other projects and a problem with high noise sidebands
> > > > > > > > > on the two local oscillators. However, we have recently
> > > > > > > > > re-started to project and appear to have found the cause
> > > > > > > > > of the noise.
> > > > > > > > >
> > > > > > > > > In any case there is no problem with either the Dielectric
> > > > > > > > > or SAW filters.
> > > > > > > > >
> > > > > > > > > Regards
> > > > > > > > >
> > > > > > > > > Phil...VK6APH
> > > > > > > > >
> > > > > > > > > > Hi,
> > > > > > > > > >
> > > > > > > > > > I am new here, but I am kind of innovative type.
> > > > > > > > > >
> > > > > > > > > > I am thinking to build a even smaller kind of
> > > > > > > > > > everything-in-it version of the wonderful spectrum
> > > > > > > > > > analyzer (USB based. Software written in C/C++ instead
> > > > > > > > > > of Liberty Basic, compact..), and I am doing researches
> > > > > > > > > > on the possibilities and ways to realize my ambitions.
> > > > > > > > > >
> > > > > > > > > > Hopefully, my ambition does not seem too radical...
> > > > > > > > > >
> > > > > > > > > > Looking briefly at the project, I think that replacing
> > > > > > > > > > coaxial
> > > > > > >
> > > > > > > cavity
> > > > > > >
> > > > > > > > > > filter may help reducing the entire volume quite a bit.
> > > > > > > > > > Searching online for bit, do not seem to find any good
> > > > > > > > > > substitutes. These
> > > > > > >
> > > > > > > are
> > > > > > >
> > > > > > > > > > what I have researched and tried:
> > > > > > > > > >
> > > > > > > > > > 1. Try to find a pair of high pass filter and low pass
> > > > > > > > > > filter.
> > > > > > >
> > > > > > > But
> > > > > > >
> > > > > > > > > > nothing can get closer to 2MHz pass band. The closet
> > > > > > > > > > match now is 20MHz.
> > > > > > > > > >
> > > > > > > > > > 2. My RF friend suggested using RF resonantor. Do not
> > > > > > > > > > know how to design one yet.

> > > > > > > > > >
> > > > > > > > > > > 3. Searched research papers in components substituting
> > > > > > > > > > > coaxial cavity. Not very fruitful so far.
> > > > > > > > > > >
> > > > > > > > > > > Has any long-timer and experienced RF engineers in the
> > > > > > > > > > > group here thought about this question and found
> > > > > > > > > > > something useful? Would you please share with me your
> > > > > > > > > > > experience?

Yahoo! Groups Links

http://docs.yahoo.com/info/terms/

8359. Re: [spectrumanalyzer] replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-05 18:03:07 UTC
From: Amos Ku
Topic: 8303 Message: 8359

William,

Right. I think at this point. I just have a little spare to spend on. I think soon or later we will find a cheaper alternative. Just need to keep trying and searching. We will find a way.

Amos

From: William Dillon <hpux735@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Friday, August 5, 2011 10:53 AM
Subject: Re: [spectrumanalyzer] replacement to coaxial cavity filter

The price is surely a significant disadvantage. The cost in parts (surely not time) for 10 cavity filters would be less than one 3-filter cascade using this part.

On Aug 5, 2011, at 10:42 AM, inlinebeginner wrote:

>If you look at Digikey, under ceramic filter, you can found this:
>http://media.digikey.com/pdf/Data%20Sheets/CTS%20Corporation%20PDFs/KFF6402A.pdf
>
>center frequency 1.09G , 6MHz BW, 45dB rejection at +45MHz. 2 dB insertion loss;
>If we can use 3 in cascade, the insertion loss would be the same as current cavity filter, while the rejection at 40MHz should be 80dB or higher. The BW would drop to 4 or 3MHz, similar to curren cavity filter (2MHz).
>The advantage: small size 34x8 mm each; if we can use 25MHz crystal filter as IF2.
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>> > than 2*IF2 (about 21.4MHz for a 10.7MHz RBW filter) and the rejection at
>> > +2*IF2 (off center freq) needs about 80 to 105dB, as Sam said. This
>> > requirement seems to be very critical for a microstripline filter, but we
>> > still can try how small its transient band can be. Once we have that
>> > number, we might want to add one more IF between IF1 to IF2 (maybe we can
>> > call it IF1a). If we look at the structure of early HP 8558B, a 1.5G SA,
>> > it has IF1=2050MHz, IF2=301.4 and IF3=21.4MHz. The reason it uses IF2=
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>> > and get better image frequency rejection for mixer2. Once the frequency is
>> > dropped to 301.4MHz, the mixer3's image freq rejection becomes easier. i.e
>> > a 301.4MHz LPF or BPF can be much easier to implement a transient band of
>> > 2*21.4=42.8MHz than a 2050MHz filter. Adding one more mix/PLO into current
>> > MSA, may not cost much. A combo IC (of mixer, PLL, VCO) RFFC2071 only cost
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>> > > >
>> > > > Amos
>> > > >
>> > > > ----------

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>> > > > >
>> > > > > USE ONLY 0.8mm FR4.
>> > > > >
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>> > > >
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>> > > >
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>> > > >
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>> > > > > applications, you can use QUCS instead. The layouit and syntax is
>> > > > > almost
>> > > >
>> > > > 100%
>> > > >
>> > > > > equal to ADS but it's free and open source. QUCS is available both on
>> > > >
>> > > > Linux
>> > > >
>> > > > > and on Windooze.
>> > > > >
>> > > > > Again, I have both articles but will not drop them to the group. You
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>> > > > tp
>> > > >
>> > > > > email me directly for a non-commercial priavte copy.
>> > > > > (One day it might be me or you that creates something we want to
>> > > >
>> > > > copyright,
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>> > > > > > > >

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>> > > > > > > > >
>> > > > > > > > > 2. My RF friend suggested using RF resonantor. Do not know
>> > > > > > > > > how to design one yet.
>> > > > > > > > >
>> > > > > > > > > 3. Searched research papers in components substituting
>> > > > > > > > > coaxial cavity. Not very fruitful so far.
>> > > > > > > > >
>> > > > > > > > > Has any long-timer and experienced RF engineers in the group
>> > > > > > > > > here thought about this question and found something useful?
>> > > > > > > > > Would you please share with me your experience?
>>
>
>

8360. Re: [spectrumanalyzer] Re: replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-05 18:40:19 UTC
From: Amos Ku
Topic: 8303 Message: 8360

The coaxial cavity filter has only 2.5MHz. Not sure if 6MHz BW will be still in the okay range for image rejection.

From: inlinebeginner <inlinebeginner@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Friday, August 5, 2011 10:42 AM
Subject: [spectrumanalyzer] Re: replacement to coaxial cavity filter

If you look at Digikey, under ceramic filter, you can found this:
http://media.digikey.com/pdf/Data%20Sheets/CTS%20Corporation%20PDFs/KFF6402A.pdf

center frequency 1.09G , 6MHz BW, 45dB rejection at +45MHz. 2 dB insertion loss;
If we can use 3 in cascade, the insertion loss would be the same as current cavity filter, while the rejection at 40MHz should be 80dB or higher. The BW would drop to 4 or 3MHz, similar to curren cavity filter (2MHz).
The advantage: small size 34x8 mm each; if we can use 25MHz crystal filter as IF2.
Disadvantage: Expensive $50 each.

What we are discussing is only for SA, a portable SA, not including the VNA.

Lin

--- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:
>
> Lin,
>
> Cascading is fine as long as the insertion loss is low.
> This is not always the case with stripline filters.
>
> //Dan, M0DFI
>
> On Friday 05 August 2011 14:55:34 you wrote:
> > I like what Amos is doing. To make the impossible to be possible, we really
> > need this kind of topic and brainstorm. Even we fail we still could learn
> > a lot from his tries. The cavity filter's transient band has to be less
> > than 2*IF2 (about 21.4MHz for a 10.7MHz RBW filter) and the rejection at
> > +2*IF2 (off center freq) needs about 80 to 105dB, as Sam said. This
> > requirement seems to be very critical for a microstripline filter, but we
> > still can try how small its transient band can be. Once we have that
> > number, we might want to add one more IF between IF1 to IF2 (maybe we can
> > call it IF1a). If we look at the structure of early HP 8558B, a 1.5G SA,
> > it has IF1=2050MHz, IF2=301.4 and IF3=21.4MHz. The reason it uses IF2=
> > 301.4MHz might be just to provide a wider transient band for cavity filter
> > and get better image frequency rejection for mixer2. Once the frequency is
> > dropped to 301.4MHz, the mixer3's image freq rejection becomes easier. i.e

> > a 301.4MHz LPF or BPF can be much easier to implement a transient band of
> > 2*21.4=42.8MHz than a 2050MHz filter. Adding one more mix/PLO into current
> > MSA, may not cost much. A combo IC (of mixer, PLL, VCO) RFFC2071 only cost
> > less than $30, with at least 90dB phase noise. If we use HP8558's IF2
> > number, 301.4MHz, the cavity filter transient band can be 602.8MHz, I
> > think it is possible to implement this number in a 1013.7MHz LPF or BPF
> > microstrip line filte or we can use other filters in casecade.
> >
> > Thanks
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@> wrote:
> > > Keep on Amos. That microstrip research paper that you unearthed
> > > looks promissing.
> > > Certainly is not a rehash and being published in 2008 is not "old stuff".
> > >
> > > Jim W1JGH
> > >
> > > On Thu, Aug 4, 2011 at 7:57 PM, Amos Ku <amosku@> wrote:
> > > > **
> > > >
> > > >
> > > > Thanks.
> > > >
> > > > I am not trying to persuade anyone to deviate from Scotty's design. His
> > > > design is wonderful and inexpensive. This is very good for the
> > > > hobbyists like people in this group.
> > > >
> > > > I am just trying to be a little out-of-ordinarily ambitious and trying
> > > > everything I can to push the final design of mine close to the
> > > > professional level, while maintain the simplicity of original design
> > > > idea.
> > > >
> > > > As I can see, many things can be done to improve the entire design. I
> > > > am just starting to try out different things.
> > > >
> > > >
> > > > Amos
> > > >
> > > > ------------------------------
> > > > *From:* Sam <swetterlin@>
> > > > *To:* spectrumanalyzer@yahoogroups.com
> > > > *Sent:* Thursday, August 4, 2011 4:43 PM
> > > > *Subject:* [spectrumanalyzer] Re: replacement to coaxial cavity filter
> > > >
> > > >
> > > > Interesting stuff. The article is at:
> > > > <http://www.hparchive.com/Bench_Briefs/HP-Bench-Briefs-1989-01-03.pdf>
> > > > Seems to be fairly broad-bandwidth, though.
> > > > Sam W.

> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@> wrote:
> > > > > Amos,
> > > > >
> > > > > The article you refer to is nothing new. Look for an article from 1st
> > > > >
> > > > > quarter
> > > > >
> > > > > 1989 "How To Build a Stripline Filter". It's stored at
> > > > > www.hparchive.com
> > > > >
> > > > > Normally, a 1GHz stripline filter is rather large. But by grounding
> > > > > the endstubs, you almost half the frequency of the filter without
> > > > > any other changes.
> > > > >
> > > > > If you don't have the article, mail me directly. This artcle gives
> > > > > the
> > > > >
> > > > > math
> > > > >
> > > > > for the filter design so you can't really miss.
> > > > >
> > > > > The grounded stripline filter is less susceptive to detune when
> > > > > mounted
> > > > >
> > > > > in a
> > > > >
> > > > > metal box. The open stripline filter is more sensitive to
> > > > > environmental capacitances.
> > > > >
> > > > > USE ONLY 0.8mm FR4.
> > > > >
> > > > > Rogers and alikes is a Royal waste of money for only 1GHz, save it
> > > > > for 3+
> > > > >
> > > > > GHz.
> > > > >
> > > > > Do not use 1.0 or 1.5mm FR4. If you only have 1.5mm, don't really
> > > > > bother
> > > > >
> > > > > as
> > > > >
> > > > > even 1GHz is a border case.
> > > > >
> > > > > You really have to mount the filters in proper boxes!
> > > > >
> > > > > Another good article is "The Design, Fabrication and Measurement of
> > > > >
> > > > > Microstrip
> > > > >

> > > > > Filter and Coupler Circuits" by Dana Brady at CA Wireless, Inc.
> > > > > It was published in July 2002 "High Frequency Electronics" and is
> > > >
> > > > Copyrighted
> > > >
> > > > > 2002 by Sumit Technical Media, LLC
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> > > > > > > > > >
> > > > > > > > > > 3. Searched research papers in components substituting
> > > > > > > > > > coaxial cavity. Not very fruitful so far.
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> > > > > > > > > > Has any long-timer and experienced RF engineers in the group
> > > > > > > > > > here thought about this question and found something useful?
> > > > > > > > > > Would you please share with me your experience?
>

8361. Re: replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-05 19:02:09 UTC
From: inlinebeginner
Topic: 8303 Message: 8361

The image rejection may not relate to cavity BW, it depends upon the cavity filter rejection at 2*IF2 away from center frequency.
If you can meet the image rejection, it might be ok for a 6MHz BW cavity filter, because the widest RBW filter is normally less than 1MHz.
Lin

--- In spectrumanalyzer@yahoogroups.com, Amos Ku <amosku@...> wrote:
>
> The coaxial cavity filter has only 2.5MHz. Not sure if 6MHz BW will be still in the okay range for image rejection.
>
>
>
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> From: inlinebeginner <inlinebeginner@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Friday, August 5, 2011 10:42 AM
> Subject: [spectrumanalyzer] Re: replacement to coaxial cavity filter
>
>
> Â
> If you look at Digikey, under ceramic filter, you can found this:
> http://media.digikey.com/pdf/Data%20Sheets/CTS%20Corporation%20PDFs/KFF6402A.pdf
>
> center frequency 1.09G , 6MHz BW, 45dB rejection at +45MHz. 2 dB insertion loss;
> If we can use 3 in cascade, the insertion loss would be the same as current cavity filter, while the rejection at 40MHz should be 80dB or higher. The BW would drop to 4 or 3MHz, similar to curren cavity filter (2MHz).
> The advantage: small size 34x8 mm each; if we can use 25MHz crystal filter as IF2.
> Disadvantage: Expensive $50 each.
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> What we are discussing is only for SA, a portable SA, not including the VNA.
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> > This is not always the case with stripline filters.
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> > > need this kind of topic and brainstorm. Even we fail we still could learn
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> > > +2*IF2 (off center freq) needs about 80 to 105dB, as Sam said. This
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> > > > > As I can see, many things can be done to improve the entire design. I
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> > > > >
> > > > >

> > > > > Amos
> > > > >
> > > > > ----------
> > > > > *From:* Sam <swetterlin@>
> > > > > *To:* spectrumanalyzer@yahoogroups.com
> > > > > *Sent:* Thursday, August 4, 2011 4:43 PM
> > > > > *Subject:* [spectrumanalyzer] Re: replacement to coaxial cavity filter
> > > > >
> > > > >
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> > > > > Sam W.
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> > > > > >
> > > > > > The article you refer to is nothing new. Look for an article from 1st
> > > > >
> > > > > quarter
> > > > >
> > > > > > 1989 "How To Build a Stripline Filter". It's stored at
> > > > > > www.hparchive.com
> > > > > >
> > > > > > Normally, a 1GHz stripline filter is rather large. But by grounding
> > > > > > the endstubs, you almost half the frequency of the filter without
> > > > > > any other changes.
> > > > > >
> > > > > > If you don't have the article, mail me directly. This artcle gives
> > > > > > the
> > > > >
> > > > > math
> > > > >
> > > > > > for the filter design so you can't really miss.
> > > > > >
> > > > > > The grounded stripline filter is less susceptive to detune when
> > > > > > mounted
> > > > >
> > > > > in a
> > > > >
> > > > > > metal box. The open stripline filter is more sensitive to
> > > > > > environmental capacitances.
> > > > > >
> > > > > > USE ONLY 0.8mm FR4.
> > > > > >
> > > > > > Rogers and alikes is a Royal waste of money for only 1GHz, save it
> > > > > > for 3+
> > > > >
> > > > > GHz.
> > > > >

> > > > > > Do not use 1.0 or 1.5mm FR4. If you only have 1.5mm, don't really
> > > > > > bother
> > > > > >
> > > > > > as
> > > > > >
> > > > > > > even 1GHz is a border case.
> > > > > > >
> > > > > > > You really have to mount the filters in proper boxes!
> > > > > > >
> > > > > > > Another good article is "The Design, Fabrication and Measurement of
> > > > > >
> > > > > > Microstrip
> > > > > >
> > > > > > > Filter and Coupler Circuits" by Dana Brady at CA Wireless, Inc.
> > > > > > > It was published in July 2002 "High Frequency Electronics" and is
> > > > > >
> > > > > > Copyrighted
> > > > > >
> > > > > > > 2002 by Sumit Technical Media, LLC
> > > > > > >
> > > > > > >
> > > > > > > Many articles refer to Agilent ADS. It's a nice piece of software but
> > > > > > > for
> > > > > >
> > > > > > most
> > > > > >
> > > > > > > applications, you can use QUCS instead. The layouit and syntax is
> > > > > > > almost
> > > > > >
> > > > > > 100%
> > > > > >
> > > > > > > equal to ADS but it's free and open source. QUCS is available both on
> > > > > >
> > > > > > Linux
> > > > > >
> > > > > > > and on Windooze.
> > > > > > >
> > > > > > > Again, I have both articles but will not drop them to the group. You
> > > > > > > need
> > > > > >
> > > > > > tp
> > > > > >
> > > > > > > email me directly for a non-commercial priavte copy.
> > > > > > > (One day it might be me or you that creates something we want to
> > > > > >
> > > > > > copyright,
> > > > > >
> > > > > > > so let us respect theirs)
> > > > > > >
> > > > > > >

> > > > > >
> > > > > > //Dan, M0DFI
> > > > > >
> > > > > > On Thursday 04 August 2011 23:27:09 you wrote:
> > > > > > > Look at what I have just found:
> > > > > > > >
> > > > > > > > http://www.jpier.org/PIER/pier78/25.07091401.Hasan.N.pdf.
> > > > > > > >
> > > > > > > > The title of this article is:
> > > > > > > > NOVEL MICROSTRIP HAIRPINLINE NARROWBAND BANDPASS FILTER USING VIA
> > > > > >
> > > > > > GROUND
> > > > > >
> > > > > > > > HOLES. Wow! If I can tune this filter to that of the coaxial cavity
> > > > > > > > filter. I can greatly reduce the room for a coaxial cavity filter!
> > > > > > > >
> > > > > > > >
> > > > > > > >
> > > > > > > >
> > > > > > > > _____
> > > > > > > > From: Berndt Josef Wulf <wulf@>
> > > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > > Sent: Tuesday, August 2, 2011 10:24 PM
> > > > > > > > Subject: Re: [spectrumanalyzer] replacement to coaxial cavity
> > > > > > > > filter
> > > > > > > >
> > > > > > > >
> > > > > > > >
> > > > > > > > G'day Amos,
> > > > > > > >
> > > > > > > > No partnumbers, but some models are listed below.
> > > > > > > >
> > > > > > > > ARC Cessna RT359A
> > > > > > > > Collins TDR-950
> > > > > > > > King Radio KT76, KT76A, KT78
> > > > > > > > Narco AT50A, AT150
> > > > > > > >
> > > > > > > > These are the more common models found in general avionation.
> > > > > > > >
> > > > > > > > Most require modifications such fitting suitable connectors,
> > > > > > > > removal of mixer diode etc, but all this is relatively straight
> > > > > > > > forward.
> > > > > > > >
> > > > > > > > 73, Berndt
> > > > > > > > VK5ABN
> > > > > > > >
> > > > > > > > On Wed, 3 Aug 2011 14:22:08 you wrote:
> > > > > > > > > Cheerio Berndt,
> > > > > > > >
> > > > > > > >

> > > > > > > > I am not familiar with avionics IFF transponders.
> > > > > > > >
> > > > > > > >
> > > > > > > > Would you please give me a hint on with filters, such as part
> > > > > > > > number, website...?
> > > > > > > >
> > > > > > > >
> > > > > > > > Amos
> > > > > > > >
> > > > > > > >
> > > > > > > >
> > > > > > > > _____
> > > > > > > > From: Berndt Josef Wulf <wulf@>
> > > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > > Sent: Tuesday, August 2, 2011 7:45 PM
> > > > > > > > Subject: Re: [spectrumanalyzer] replacement to coaxial cavity
> > > > > > > > filter
> > > > > > > >
> > > > > > > >
> > > > > > > >
> > > > > > > > G'day,
> > > > > > > >
> > > > > > > > an alternative to the home built coaxial cavity filter is to use
> > > > > >
> > > > > > filters
> > > > > >
> > > > > > > > from avionics IFF transponders. I've retuned a filter and was
> > > > > > > > able to
> > > > > >
> > > > > > get
> > > > > >
> > > > > > > > it within specifications.
> > > > > > > >
> > > > > > > > cheerio Berndt
> > > > > > > >
> > > > > > > > On Wed, 3 Aug 2011 11:19:15 you wrote:
> > > > > > > > > Phil,
> > > > > > > >
> > > > > > > > Thanks. That is a good news. I believe the cavity filter must
> > > > > > > > be a
> > > > > >
> > > > > > good
> > > > > >
> > > > > > > > stuff but I really cannot have gigantic boxes in my garage. I
> > > > > > > > just
> > > > > >
> > > > > > do
> > > > > >
> > > > > > > > not have room.
> > > > > > > >

> > > > > > > > >
> > > > > > > > > > Amos
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > > _____
> > > > > > > > > > From: Phil Harman <phil@>
> > > > > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > > > > Sent: Tuesday, August 2, 2011 6:31 PM
> > > > > > > > > > Subject: Re: [spectrumanalyzer] replacement to coaxial cavity
> > > > > >
> > > > > > filter
> > > > > >
> > > > > > > > > > > Hi Amos,
> > > > > > > > > > >
> > > > > > > > > > > I have had success with an alternative to a cavity filter. I
> > > > > > > > > > > use a couple of TOKO 6DFC 1.030GHz Dielectric filters.
> > > > > > > > > > >
> > > > > > > > > > > Since the skirt selectivity, even with two cascaded filters, is
> > > > > > > > > > > not adequate for a 10.7MHz second IF I increased this to
> > > > > > > > > > > 96MHz.
> > > > > > > > > > >
> > > > > > > > > > > There are a number of low cost and high performance SAW filters
> > > > > > > > > > > available at 96MHz and I used an RFM SF2135A.
> > > > > > > > > > >
> > > > > > > > > > > You could then further mix this to 10.7MHz - in my case I used
> > > > > > > > > > > an
> > > > > > >
> > > > > > > ADC
> > > > > > >
> > > > > > > > > > > on its first alias to directly digitise the 96MHz IF and did
> > > > > > > > > > > the filtering digitally.
> > > > > > > > > > >
> > > > > > > > > > > The front end closely follows Scotty's original design. You can
> > > > > > >
> > > > > > > find
> > > > > > >
> > > > > > > > > > > more details regarding the design here:
> > > > > > > > > > >
> > > > > > > > > > > <http://openhpsdr.org/wiki/index.php?title=CYCLOPS>
> > > > > > > > > > >
> > > > > > > > > > > The project has stalled for a number of years due to work on
> > > > > > > > > > > other projects and a problem with high noise sidebands on the
> > > > > > > > > > > two local oscillators. However, we have recently re-started to
> > > > > > > > > > > project and appear to have found the cause of the noise.
> > > > > > > > > > >
> > > > > > > > > > > In any case there is no problem with either the Dielectric or
> > > > > > > > > > > SAW filters.
> > > > > > > > > > >
> > > > > > > > > > > Regards

> > > > > > > > >
> > > > > > > > > > Phil...VK6APH
> > > > > > > > > >
> > > > > > > > > > > Hi,
> > > > > > > > > > >
> > > > > > > > > > > I am new here, but I am kind of innovative type.
> > > > > > > > > > >
> > > > > > > > > > > I am thinking to build a even smaller kind of
> > > > > > > > > > > everything-in-it version of the wonderful spectrum analyzer
> > > > > > > > > > > (USB based. Software written in C/C++ instead of Liberty
> > > > > > > > > > > Basic, compact..), and I am doing researches on the
> > > > > > > > > > > possibilities and ways to realize my ambitions.
> > > > > > > > > > >
> > > > > > > > > > > Hopefully, my ambition does not seem too radical...
> > > > > > > > > >
> > > > > > > > > > > Looking briefly at the project, I think that replacing
> > > > > > > > > > > coaxial
> > > > > > >
> > > > > > > cavity
> > > > > >
> > > > > > > > > > > filter may help reducing the entire volume quite a bit.
> > > > > > > > > > > Searching online for bit, do not seem to find any good
> > > > > > > > > > > substitutes. These
> > > > > >
> > > > > > are
> > > > > >
> > > > > > > > > > > what I have researched and tried:
> > > > > > > > > >
> > > > > > > > > > > 1. Try to find a pair of high pass filter and low pass
> > > > > > > > > > > filter.
> > > > > >
> > > > > > But
> > > > > >
> > > > > > > > > > > nothing can get closer to 2MHz pass band. The closet match
> > > > > > > > > > > now is 20MHz.
> > > > > > > > > >
> > > > > > > > > > > 2. My RF friend suggested using RF resonantor. Do not know
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> > > > > > > > > >
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> > > > > > > > > > > Would you please share with me your experience?
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>

8362. Re: [spectrumanalyzer] Re: replacement to coaxial cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-05 19:04:20 UTC
From: Amos Ku
Topic: 8303 Message: 8362

Yahoo! Thanks. What a relief.

Okay. I think my problem is solved for the time being. I am trying to attack the next....

_____
From: inlinebeginner <inlinebeginner@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Friday, August 5, 2011 12:02 PM
Subject: [spectrumanalyzer] Re: replacement to coaxial cavity filter

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> > > > > > the
> > > > > >
> > > > > > math
> > > > > >
> > > > > > for the filter design so you can't really miss.
> > > > > >
> > > > > > The grounded stripline filter is less susceptive to detune when
> > > > > > mounted
> > > > > >
> > > > > > in a
> > > > > >
> > > > > > metal box. The open stripline filter is more sensitive to

> > > > > > environmental capacitances.
> > > > > >
> > > > > > USE ONLY 0.8mm FR4.
> > > > > >
> > > > > > Rogers and alikes is a Royal waste of money for only 1GHz, save it
> > > > > > for 3+
> > > > > >
> > > > > > GHz.
> > > > > >
> > > > > > Do not use 1.0 or 1.5mm FR4. If you only have 1.5mm, don't really
> > > > > > bother
> > > > > >
> > > > > > as
> > > > > >
> > > > > > even 1GHz is a border case.
> > > > > >
> > > > > > You really have to mount the filters in proper boxes!
> > > > > >
> > > > > > Another good article is "The Design, Fabrication and Measurement of
> > > > > >
> > > > > > Microstrip
> > > > > >
> > > > > > Filter and Coupler Circuits" by Dana Brady at CA Wireless, Inc.
> > > > > > It was published in July 2002 "High Frequency Electronics" and is
> > > > > >
> > > > > > Copyrighted
> > > > > >
> > > > > > 2002 by Sumit Technical Media, LLC
> > > > > >
> > > > > >
> > > > > > Many articles refer to Agilent ADS. It's a nice piece of software but
> > > > > > for
> > > > > >
> > > > > > most
> > > > > >
> > > > > > applications, you can use QUCS instead. The layouit and syntax is
> > > > > > almost
> > > > > >
> > > > > > 100%
> > > > > >
> > > > > > equal to ADS but it's free and open source. QUCS is available both on
> > > > > >
> > > > > > Linux
> > > > > >
> > > > > > and on Windooze.
> > > > > >
> > > > > > Again, I have both articles but will not drop them to the group. You
> > > > > > need
> > > > > >
> > > > > > tp

> > > > >
> > > > > > email me directly for a non-commercial priavte copy.
> > > > > > (One day it might be me or you that creates something we want to
> > > > >
> > > > > copyright,
> > > > >
> > > > > > so let us respect theirs)
> > > > > >
> > > > > >
> > > > > >
> > > > > > //Dan, M0DFI
> > > > > >
> > > > > > On Thursday 04 August 2011 23:27:09 you wrote:
> > > > > > > Look at what I have just found:
> > > > > >
> > > > > > > http://www.jpier.org/PIER/pier78/25.07091401.Hasan.N.pdf.
> > > > > >
> > > > > > > The title of this article is:
> > > > > > > NOVEL MICROSTRIP HAIRPINLINE NARROWBAND BANDPASS FILTER USING VIA
> > > > >
> > > > > GROUND
> > > > >
> > > > > > > HOLES. Wow! If I can tune this filter to that of the coaxial cavity
> > > > > > > filter. I can greatly reduce the room for a coaxial cavity filter!
> > > > > >
> > > > > >
> > > > > >
> > > > > >
> > > > > > _____
> > > > > > From: Berndt Josef Wulf <wulf@>
> > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > Sent: Tuesday, August 2, 2011 10:24 PM
> > > > > > Subject: Re: [spectrumanalyzer] replacement to coaxial cavity
> > > > > > filter
> > > > > >
> > > > > >
> > > > > >
> > > > > > G'day Amos,
> > > > > >
> > > > > > No partnumbers, but some models are listed below.
> > > > > >
> > > > > > ARC Cessna RT359A
> > > > > > Collins TDR-950
> > > > > > King Radio KT76, KT76A, KT78
> > > > > > Narco AT50A, AT150
> > > > > >
> > > > > > These are the more common models found in general avionation.
> > > > > >
> > > > > > Most require modifications such fitting suitable connectors,
> > > > > > removal of mixer diode etc, but all this is relatively straight

> > > > > > > forward.
> > > > > > >
> > > > > > > 73, Berndt
> > > > > > > VK5ABN
> > > > > > >
> > > > > > > On Wed, 3 Aug 2011 14:22:08 you wrote:
> > > > > > > > Cheerio Berndt,
> > > > > > > >
> > > > > > > >
> > > > > > > > I am not familiar with avionics IFF transponders.
> > > > > > > >
> > > > > > > >
> > > > > > > > Would you please give me a hint on with filters, such as part
> > > > > > > > number, website...?
> > > > > > > >
> > > > > > > >
> > > > > > > > Amos
> > > > > > > >
> > > > > > > >
> > > > > > > >
> > > > > > > > _____
> > > > > > > > From: Berndt Josef Wulf <wulf@>
> > > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > > Sent: Tuesday, August 2, 2011 7:45 PM
> > > > > > > > Subject: Re: [spectrumanalyzer] replacement to coaxial cavity
> > > > > > > > filter
> > > > > > > >
> > > > > > > >
> > > > > > > >
> > > > > > > > G'day,
> > > > > > > >
> > > > > > > > an alternative to the home built coaxial cavity filter is to use
> > > > > >
> > > > > > filters
> > > > > >
> > > > > > > > from avionics IFF transponders. I've retuned a filter and was
> > > > > > > > able to
> > > > > >
> > > > > > get
> > > > > >
> > > > > > > > it within specifications.
> > > > > > > >
> > > > > > > > cheerio Berndt
> > > > > > > >
> > > > > > > > On Wed, 3 Aug 2011 11:19:15 you wrote:
> > > > > > > > > Phil,
> > > > > > > >
> > > > > > > > Thanks. That is a good news. I believe the cavity filter must
> > > > > > > > be a
> > > > > > >

> > > > > good
> > > > >
> > > > > > > > > stuff but I really cannot have gigantic boxes in my garage. I
> > > > > > > > > just
> > > > > >
> > > > > > do
> > > > > >
> > > > > > > > > > not have room.
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > > Amos
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > > _____
> > > > > > > > > > From: Phil Harman <phil@>
> > > > > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > > > > Sent: Tuesday, August 2, 2011 6:31 PM
> > > > > > > > > > Subject: Re: [spectrumanalyzer] replacement to coaxial cavity
> > > > > >
> > > > > > filter
> > > > > >
> > > > > > > > > > Hi Amos,
> > > > > > > > > >
> > > > > > > > > > I have had success with an alternative to a cavity filter. I
> > > > > > > > > > use a couple of TOKO 6DFC 1.030GHz Dielectric filters.
> > > > > > > > > >
> > > > > > > > > > Since the skirt selectivity, even with two cascaded filters, is
> > > > > > > > > > not adequate for a 10.7MHz second IF I increased this to
> > > > > > > > > > 96MHz.
> > > > > > > > > >
> > > > > > > > > > There are a number of low cost and high performance SAW filters
> > > > > > > > > > available at 96MHz and I used an RFM SF2135A.
> > > > > > > > > >
> > > > > > > > > > You could then further mix this to 10.7MHz - in my case I used
> > > > > > > > > > an
> > > > > > >
> > > > > > ADC
> > > > > >
> > > > > > > > > > on its first alias to directly digitise the 96MHz IF and did
> > > > > > > > > > the filtering digitally.
> > > > > > > > > >
> > > > > > > > > > The front end closely follows Scotty's original design. You can
> > > > > >
> > > > > > find
> > > > > >
> > > > > > > > > > more details regarding the design here:
> > > > > > > > > >
> > > > > > > > > > <http://openhpsdr.org/wiki/index.php?title=CYCLOPS>
> > > > > > > > > >

> > > > > > > > > The project has stalled for a number of years due to work on
> > > > > > > > > > other projects and a problem with high noise sidebands on the
> > > > > > > > > > two local oscillators. However, we have recently re-started to
> > > > > > > > > > project and appear to have found the cause of the noise.
> > > > > > > > > >
> > > > > > > > > > In any case there is no problem with either the Dielectric or
> > > > > > > > > > SAW filters.
> > > > > > > > > >
> > > > > > > > > > Regards
> > > > > > > > > >
> > > > > > > > > > Phil...VK6APH
> > > > > > > > > >
> > > > > > > > > > > Hi,
> > > > > > > > > > >
> > > > > > > > > > > I am new here, but I am kind of innovative type.
> > > > > > > > > > >
> > > > > > > > > > > I am thinking to build a even smaller kind of
> > > > > > > > > > > everything-in-it version of the wonderful spectrum analyzer
> > > > > > > > > > > (USB based. Software written in C/C++ instead of Liberty
> > > > > > > > > > > Basic, compact..), and I am doing researches on the
> > > > > > > > > > > possibilities and ways to realize my ambitions.
> > > > > > > > > > >
> > > > > > > > > > > Hopefully, my ambition does not seem too radical...
> > > > > > > > > > >
> > > > > > > > > > > Looking briefly at the project, I think that replacing
> > > > > > > > > > > coaxial
> > > > > >
> > > > > > cavity
> > > > > >
> > > > > > > > > > > filter may help reducing the entire volume quite a bit.
> > > > > > > > > > > Searching online for bit, do not seem to find any good
> > > > > > > > > > > substitutes. These
> > > > > >
> > > > > > are
> > > > > >
> > > > > > > > > > > what I have researched and tried:
> > > > > > > > > > >
> > > > > > > > > > > 1. Try to find a pair of high pass filter and low pass
> > > > > > > > > > > filter.
> > > > > >
> > > > > > But
> > > > > >
> > > > > > > > > > > nothing can get closer to 2MHz pass band. The closet match
> > > > > > > > > > > now is 20MHz.
> > > > > > > > > > >
> > > > > > > > > > > 2. My RF friend suggested using RF resonantor. Do not know
> > > > > > > > > > > how to design one yet.
> > > > > > > > > > >
> > > > > > > > > > > 3. Searched research papers in components substituting
> > > > > > > > > > > coaxial cavity. Not very fruitful so far.

> > > > > > > > > >
> > > > > > > > > > > Has any long-timer and experienced RF engineers in the group
> > > > > > > > > > > here thought about this question and found something useful?
> > > > > > > > > > > Would you please share with me your experience?
> >
>

8363. Expanding the bandwith to 10GHz or 20GHz

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-05 19:26:06 UTC
From: Amos Ku
Topic: 8363 Message: 8363

Hi all,

I am starting to attack my next problem. Hope I have not disturbed anyone's peace of mind near weekend.

I have been thinking if I can expand this spectrum analyzer to 10GHz, or if possible, to 20 GHz.

From my limited experience and knowledge, it seems that there have been attempts to work on the 2GHz and 3GHz options.

I am thinking if there is a way, just the way it was for DC to 1GHz option before, to create a different structure that will enable to use this SA from DC (well, some low frequencies for those experienced RF gurus.) to 10GHz directly.

Perhaps, just use another narrow bandwidth filter as optional path for people to switch to. Or, even better, having a single structure that will allow straightway from DC to 20GHz.

Many of my experiments that I wish to do involve observing harmonics and spurious signals at the 10 to 20GHz range. It will be really good if I can build a SA that can have this kind of BW.

Amos Ku

8364. Re: [spectrumanalyzer] Expanding the bandwith to 10GHz or 20GHz

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-05 19:49:08 UTC
From: Dan Andersson
Topic: 8363 Message: 8364

Amos,

Many older SA's use Harmonic Converters. These are fairly (actually) simple to build up to 26GHz.

Try S53MV's HC design but with the "Scotty" frequencies.

//Dan, M0DFI

On Friday 05 August 2011 20:26:06 you wrote:
> Hi all,
>
> I am starting to attack my next problem. Hope I have not disturbed anyone's
> peace of mind near weekend.
>
> I have been thinking if I can expand this spectrum analyzer to 10GHz, or if
> possible, to 20 GHz.
>
> From my limited experience and knowledge, it seems that there have been
> attempts to work on the 2GHz and 3GHz options.
>
> I am thinking if there is a way, just the way it was for DC to 1GHz option
> before, to create a different structure that will enable to use this SA
> from DC (well, some low frequencies for those experienced RF gurus.) to
> 10GHz directly.
>
> Perhaps, just use another narrow bandwidth filter as optional path for
> people to switch to. Or, even better, having a single structure that will
> allow straightway from DC to 20GHz.
>
> Many of my experiments that I wish to do involve observing harmonics and
> spurious signals at the 10 to 20GHz range. It will be really good if I can
> build a SA that can have this kind of BW.
>
>
>
> Amos Ku

8365. Re: [spectrumanalyzer] Expanding the bandwith to 10GHz or 20GHz

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-05 21:02:22 UTC
From: Amos Ku
Topic: 8363 Message: 8365

Dan,

Not sure what you meant. Sorry for my ignorance. I will have to do some study on HC's design, so that I know how to try HC's design and stay with Scotty's frequencies.

Amos

From: Dan Andersson <dan@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Friday, August 5, 2011 12:49 PM
Subject: Re: [spectrumanalyzer] Expanding the bandwith to 10GHz or 20GHz

Amos,

Many older SA's use Harmonic Converters. These are fairly (actually) simple to build up to 26GHz.

Try S53MV's HC design but with the "Scotty" frequencies.

//Dan, M0DFI

On Friday 05 August 2011 20:26:06 you wrote:
> Hi all,
>
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>
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> possible, to 20 GHz.
>
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> attempts to work on the 2GHz and 3GHz options.
>
> I am thinking if there is a way, just the way it was for DC to 1GHz option
> before, to create a different structure that will enable to use this SA
> from DC (well, some low frequencies for those experienced RF gurus.) to
> 10GHz directly.
>
> Perhaps, just use another narrow bandwidth filter as optional path for
> people to switch to. Or, even better, having a single structure that will
> allow straightway from DC to 20GHz.
>
> Many of my experiments that I wish to do involve observing harmonics and
> spurious signals at the 10 to 20GHz range. It will be really good if I can
> build a SA that can have this kind of BW.
>

>
>
> Amos Ku

Yahoo! Groups Links

http://docs.yahoo.com/info/terms/

8366. Re: [spectrumanalyzer] Expanding the bandwith to 10GHz or 20GHz

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-05 21:29:46 UTC
From: Amos Ku
Topic: 8363 Message: 8366

Did not have time to read it all. Only briefly scanned the web page.

Looks like this design uses no computer interface/control. Save trouble for writing programs. I will consider it an advantage for people cannot afford to buy even Liberty Basic.

Anyway, sounds like a good design as well. Will need some time to do the reading.

From: Dan Andersson <dan@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Friday, August 5, 2011 12:49 PM
Subject: Re: [spectrumanalyzer] Expanding the bandwith to 10GHz or 20GHz

Amos,

Many older SA's use Harmonic Converters. These are fairly (actually) simple
to build up to 26GHz.

Try S53MV's HC design but with the "Scotty" frequencies.

//Dan, M0DFI

On Friday 05 August 2011 20:26:06 you wrote:
> Hi all,
>
> I am starting to attack my next problem. Hope I have not disturbed anyone's
> peace of mind near weekend.
>
> I have been thinking if I can expand this spectrum analyzer to 10GHz, or if
> possible, to 20 GHz.
>
> From my limited experience and knowledge, it seems that there have been
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>
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> before, to create a different structure that will enable to use this SA
> from DC (well, some low frequencies for those experienced RF gurus.) to
> 10GHz directly.
>
> Perhaps, just use another narrow bandwidth filter as optional path for
> people to switch to. Or, even better, having a single structure that will
> allow straightway from DC to 20GHz.
>
> Many of my experiments that I wish to do involve observing harmonics and
> spurious signals at the 10 to 20GHz range. It will be really good if I can
> build a SA that can have this kind of BW.

>
>
>
> Amos Ku

Yahoo! Groups Links

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8367. Re: [spectrumanalyzer] Expanding the bandwith to 10GHz or 20GHz

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-06 15:55:16 UTC
From: Dan Andersson
Topic: 8363 Message: 8367

Hi Amos,

I set up the CNC mill for PCB filter milling today and it looked good.

Unfortunately with these computer controlled CNC milling machines - they do
exactly what they are being told to do...

Idiotic orders is sure to give an idiotic result :)

I'll make new drawings today/tomorrow unless I'm hit by to much beer...

//Dan, M0DFI

On Friday 05 August 2011 22:02:22 you wrote:
> Dan,
>
> Not sure what you meant. Sorry for my ignorance. I will have to do some
> study on HC's design, so that I know how to try HC's design and stay with
> Scotty's frequencies.
>
> Amos
>
>
>
> _____
> From: Dan Andersson <dan@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Friday, August 5, 2011 12:49 PM
> Subject: Re: [spectrumanalyzer] Expanding the bandwith to 10GHz or 20GHz
>
>
> Amos,
>
> Many older SA's use Harmonic Converters. These are fairly (actually)
> simple to build up to 26GHz.
>
> Try S53MV's HC design but with the "Scotty" frequencies.
>
> //Dan, M0DFI
>
> On Friday 05 August 2011 20:26:06 you wrote:
> > Hi all,
> >
> > I am starting to attack my next problem. Hope I have not disturbed
> > anyone's peace of mind near weekend.
> >

> > I have been thinking if I can expand this spectrum analyzer to 10GHz, or
> > if possible, to 20 GHz.
> >
> > From my limited experience and knowledge, it seems that there have been
> > attempts to work on the 2GHz and 3GHz options.
> >
> > I am thinking if there is a way, just the way it was for DC to 1GHz
> > option before, to create a different structure that will enable to use
> > this SA from DC (well, some low frequencies for those experienced RF
> > gurus.) to 10GHz directly.
> >
> > Perhaps, just use another narrow bandwidth filter as optional path for
> > people to switch to. Or, even better, having a single structure that will
> > allow straightway from DC to 20GHz.
> >
> > Many of my experiments that I wish to do involve observing harmonics and
> > spurious signals at the 10 to 20GHz range. It will be really good if I
> > can build a SA that can have this kind of BW.
> >
> >
> >
> > Amos Ku
>
> ---
>
> Yahoo! Groups Links
>
>
>
> http://docs.yahoo.com/info/terms/

8368. Re: [spectrumanalyzer] Expanding the bandwith to 10GHz or 20GHz

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-06 19:06:28 UTC
From: Amos Ku
Topic: 8363 Message: 8368

Dan,

Thanks for the update, and I admire your effort.

Best Regards,

Amos Ku

On Aug 6, 2011, at 8:55 AM, Dan Andersson <dan@...> wrote:

> Hi Amos,
>
> I set up the CNC mill for PCB filter milling today and it looked good.
>
> Unfortunately with these computer controlled CNC milling machines - they do
> exactly what they are being told to do...
>
> Idiotic orders is sure to give an idiotic result :)
>
> I'll make new drawings today/tomorrow unless I'm hit by to much beer...
>
> //Dan, M0DFI
>
>
> On Friday 05 August 2011 22:02:22 you wrote:
>> Dan,
>>
>> Not sure what you meant. Sorry for my ignorance. I will have to do some
>> study on HC's design, so that I know how to try HC's design and stay with
>> Scotty's frequencies.
>>
>> Amos
>>
>>
>>
>> _____
>> From: Dan Andersson <dan@...>
>> To: spectrumanalyzer@yahoogroups.com
>> Sent: Friday, August 5, 2011 12:49 PM
>> Subject: Re: [spectrumanalyzer] Expanding the bandwith to 10GHz or 20GHz
>>
>>
>> Amos,
>>
>> Many older SA's use Harmonic Converters. These are fairly (actually)
>> simple to build up to 26GHz.

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>> Try S53MV's HC design but with the "Scotty" frequencies.
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>> On Friday 05 August 2011 20:26:06 you wrote:
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>>>
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>>> if possible, to 20 GHz.
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>>> attempts to work on the 2GHz and 3GHz options.
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>>> this SA from DC (well, some low frequencies for those experienced RF
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>>>
>>> Perhaps, just use another narrow bandwidth filter as optional path for
>>> people to switch to. Or, even better, having a single structure that will
>>> allow straightway from DC to 20GHz.
>>>
>>> Many of my experiments that I wish to do involve observing harmonics and
>>> spurious signals at the 10 to 20GHz range. It will be really good if I
>>> can build a SA that can have this kind of BW.
>>>
>>>
>>>
>>> Amos Ku
>>
>> ------------------------------------
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> Yahoo! Groups Links
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8369. Isolation amplifiers

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 14:21:39 UTC
From: jghbeta
Topic: 8369 Message: 8369

An issue that came up during phase calibration has to do with an isolation amplifier at the output of Mixer 3. This amplifier together with another one between PLO2 and Mixer 3 is supposed to cut down leakage to Mixer 2. However, the amplifier cuts off frequencies below 250 Hz. The effect is a sharp dip of the magnitude trace as seen during phase calibration VNA mode which then climbs up to reach its normal output level after300-400 MHz.. I removed the amplifier without any apparent detrimental effects on the leakage. The trace is back to normal: a fairly flat line from 0 to 1000 MHz at around -20 dBm.
Jim W1JGH

8370. USB update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 14:44:19 UTC
From: jghbeta
Topic: 6514 Message: 8370

After a few intensive debugging sessions with the help of Scotty I got my the MSA working with 100% USB interface to my computer. 100% means that I don't use the control board at all. As far as I have been able to determine all functionality is there. The following summarizes what I have learnt and the changes that were required:

1. SOFTWARE. Version 116L does not require any changes to run USB with one exception: if you are using the 4112/4113 charge pumps in any of the PLO's, then a change must be made to the code. It will be incorporated into the next revision by Scotty.

2. USB INTERFACE: I use the EZUSB board with the 128 pin Cypress chip. It is available in eBay. Don't use a 56 pin chip or you will run out of ports. The drivers and instructions were posted to the group by Dave Roberts .

3. MSA HARDWARE MODIFICATIONS: The only changes have to do with the ADC board

a) THE MUN2211 buffers must be changed to 2N7002 FETs. Each one must have a 10K pull down resistor from gate to ground and a 4K7 pull up resistor. A 100pF cap MAY be needed from gate to ground.

b) In order to protect the USB chip ports when the board is not energized and the MSA starts, the power to the 2N7002 pull-up resistors MUST COME from the USB board (3.3 or 5 volts are available). Although the USB chip operates from 3.3 volts, its ports may accept up to 5.5 (I prefer 3.3 myself).

c) The SERCLK and CONVERT lines must be decoupled with 100pF capacitors at the ADC board.

I have prepared a 1.2x2.4 SLIM which includes the ADC and the video switch boards into one and incorporates all the changes described above. If there is any interest I'll do a small group buy. Just let me know.

d) WIRING. Of course, all control wiring (boards PDM, ADC, PLO 1,2, 3, DDS 1, 3 and switches) has to be moved to the USB ports. I will post a wiring diagram in the files area although I believe that Scotty is going to do the same at his site. This sounds like a lot of work but gave the opportunity to clean up my snake's nest.

4. POWER SUPPLY
The conventional power supply at the control board may continue to be used. For sake of neatness I installed Sam W. power supply.

I believe that's all

Jim W1JGH

8371. Re: Isolation amplifiers

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 15:03:59 UTC
From: Sam
Topic: 8369 Message: 8371

Cuts off frequencies below 250 Hz? Do you mean 250 MHz? I don't see how frequencies below 250 Hz would be relevant.

The optional amp on the Mixer 3 output is not really for leakage reduction; it is to improve the return loss of the TG port and to prevent high frequency reflections back into Mixer 3. Such reflections can affect the net signal strength of the TG and thus distort measurements (even at low frequencies), depending on the nature of high frequency reflections from whatever the TG is attached to.

It's frequency coverage depends entirely on coupling capacitors, so it should be easy to handle everything above 100 kHz, or even lower if you want.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> An issue that came up during phase calibration has to do with an isolation amplifier at the output of Mixer 3. This amplifier together with another one between PLO2 and Mixer 3 is supposed to cut down leakage to Mixer 2. However, the amplifier cuts off frequencies below 250 Hz. The effect is a sharp dip of the magnitude trace as seen during phase calibration VNA mode which then climbs up to reach its normal output level after300-400 MHz.. I removed the amplifier without any apparent detrimental effects on the leakage. The trace is back to normal: a fairly flat line from 0 to 1000 MHz at around -20 dBm.
> Jim W1JGH
>

8372. Re: USB update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 15:33:13 UTC
From: Sam
Topic: 6514 Message: 8372

Good work. I'm sure a lot of people will find that helpful. Just to clarify for everyone: Jim already confirmed that USB works when wired through the control board. This latest effort allows you to dispense with the control board. If you already have the control board, you may choose to use USB with the control board, but if you are just building, there is no point to using the control board (unless you want it for the power supply). I designed a substitute board that provides +10 and +23V, called the Power Board. Not sure where I posted it.

Jim, any idea as to how the speed of USB compares to the parallel port?

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> After a few intensive debugging sessions with the help of Scotty I got my the MSA working with 100% USB interface to my computer. 100% means that I don't use the control board at all. As far as I have been able to determine all functionality is there. The following summarizes what I have learnt and the changes that were required:
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> 1. SOFTWARE. Version 116L does not require any changes to run USB with one exception: if you are using the 4112/4113 charge pumps in any of the PLO's, then a change must be made to the code. It will be incorporated into the next revision by Scotty.
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> 2. USB INTERFACE: I use the EZUSB board with the 128 pin Cypress chip. It is available in eBay. Don't use a 56 pin chip or you will run out of ports. The drivers and instructions were posted to the group by Dave Roberts .
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> 3. MSA HARDWARE MODIFICATIONS: The only changes have to do with the ADC board
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> a) THE MUN2211 buffers must be changed to 2N7002 FETs. Each one must have a 10K pull down resistor from gate to ground and a 4K7 pull up resistor. A 100pF cap MAY be needed from gate to ground.
>
> b) In order to protect the USB chip ports when the board is not energized and the MSA starts, the power to the 2N7002 pull-up resistors MUST COME from the USB board (3.3 or 5 volts are available). Although the USB chip operates from 3.3 volts, its ports may accept up to 5.5 (I prefer 3.3 myself).
>
> c) The SERCLK and CONVERT lines must be decoupled with 100pF capacitors at the ADC board.
>
> I have prepared a 1.2x2.4 SLIM which includes the ADC and the video switch boards into one and incorporates all the changes described above. If there is any interest I'll do a small group buy. Just let me know.
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> d) WIRING. Of course, all control wiring (boards PDM, ADC, PLO 1,2, 3, DDS 1, 3 and switches) has to be moved to the USB ports. I will post a wiring diagram in the files area

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> Jim W1JGH
>

8373. Re: USB update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 17:17:08 UTC
From: william sprowls
Topic: 6514 Message: 8373

Hi Sam and All,
I don't think Jim H. ever got the USB to Control Board active. But I can answer that question.
As a relative measurement, the sweep time for 400 steps in the Spectrum Analyzer mode:
Parallel LPT to Slim Control Board, 1.84 seconds.
USB to Slim Control Board, 1.91 seconds.
I can simulate the USB Directly to Slims (no control board) and it is essentially the same, 1.89 seconds.
(Using really fast computer, WinXP, and USB2.)
Hardly any difference. However, the "string" commanding that the USB is using is not quite as efficient as it could be. Also there is a minor problem with the "string" structure that I had to circumvent with a tiny hardware change. Right now, the USB will not work with earlier versions of Windows. I will get with Dave on these areas.
Scotty

--- On Tue, 8/9/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: USB update
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, August 9, 2011, 10:33 AM

Good work. I'm sure a lot of people will find that helpful. Just to clarify for everyone: Jim already confirmed that USB works when wired through the control board. This latest effort allows you to dispense with the control board. If you already have the control board, you may choose to use USB with the control board, but if you are just building, there is no point to using the control board (unless you want it for the power supply). I designed a substitute board that provides +10 and +23V, called the Power Board. Not sure where I posted it.

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Sam W.

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> Jim W1JGH

>

8374. Re: [spectrumanalyzer] USB update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 17:37:40 UTC
From: William Dillon
Topic: 6514 Message: 8374

Are the USB->SLIM connections still the same?

I designed a PCB assuming the connections in "Controller Hardware.pdf" posted on Aug 18th 2010. I sent the board out to be mfg'd, but haven't gotten it yet. Assuming that it works and is accurately reflects the contents of this document, should it work?

On Aug 9, 2011, at 10:17 AM, william sprowls wrote:

> Hi Sam and All,
> I don't think Jim H. ever got the USB to Control Board active. But I can answer that question.
> As a relative measurement, the sweep time for 400 steps in the Spectrum Analyzer mode:
> Parallel LPT to Slim Control Board, 1.84 seconds.
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> Scotty
>
> --- On Tue, 8/9/11, Sam <swetterlin@...> wrote:
>
> From: Sam <swetterlin@...>
> Subject: [spectrumanalyzer] Re: USB update
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, August 9, 2011, 10:33 AM
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> Good work. I'm sure a lot of people will find that helpful. Just to clarify for everyone: Jim already confirmed that USB works when wired through the control board. This latest effort allows you to dispense with the control board. If you already have the control board, you may choose to use USB with the control board, but if you are just building, there is no point to using the control board (unless you want it for the power supply). I designed a substitute board that provides +10 and +23V, called the Power Board. Not sure where I posted it.
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> Jim, any idea as to how the speed of USB compares to the parallel port?
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> Sam W.
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> --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
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> > After a few intensive debugging sessions with the help of Scotty I got my the MSA

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>
>
>

8375. BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 20:04:56 UTC
From: Dan Andersson
Topic: 8375 Message: 8375

Sam,

What bandwith can you "get away with" when replacing the cavity filter?

I've been running a cople of iterations of milled filters now but with different bandwidths.

//Dan, M0DFI

8376. Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 21:00:03 UTC
From: Greg Broburg
Topic: 8375 Message: 8376

My suggestion is to make it 3MHz wide and to make
that the widest IF by bypassing the narrower band
10 MHz filter with a pass through. Other narrower IFs
can be made by adding narrower 10M7 filters in place
of the bypass.

Greg

On 8/9/2011 3:04 PM, Dan Andersson wrote:
>
> Sam,
>
> What bandwith can you "get away with" when replacing the cavity filter?
>
> I've been running a cople of iterations of milled filters now but with
> different
> bandwidths.
>
> //Dan, M0DFI
>
>

8377. Re: [spectrumanalyzer] USB update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 21:08:56 UTC
From: william sprowls
Topic: 6514 Message: 8377

Hi William,
Yes, that document is valid. Since then, proposed modules have been added to the MSA as optional items. These will take up the bits that this document calls "spares". These include:
RF Band Switch for B1/B2/B3
Video Bandwidth Filter
VNA Router Switch
I will update the MSA wiring diagram to include all of the signals. This is what Jim was referring to.
Scotty

--- On Tue, 8/9/11, William Dillon <hpux735@...> wrote:

From: William Dillon <hpux735@...>
Subject: Re: [spectrumanalyzer] USB update
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, August 9, 2011, 12:37 PM

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Scotty

--- On Tue, 8/9/11, Sam
<swetterlin@comcast.net> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: USB update
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, August 9, 2011, 10:33 AM

Good work. I'm sure a lot of people will find that helpful. Just to clarify for everyone: Jim already confirmed that USB works when wired through the control board. This latest effort allows you to dispense with the control board. If you already have the control board, you may choose to use USB with the control board, but if you are just building, there is no point to using the control board (unless you want it for the power supply). I designed a substitute board that provides +10 and +23V, called the Power Board. Not sure where I posted it.

Jim, any idea as to how the speed of USB compares to the parallel port?

Sam W.

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> The conventional power supply at the control board may continue to be used. For sake of neatness I installed Sam W. power supply.

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> Jim W1JGH

>

8378. New file uploaded to spectrumanalyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 21:11:28 UTC
From: spectrumanalyzer@yahoogroups.com
Topic: 111 Message: 8378

Hello,

This email message is a notification to let you know that
a file has been uploaded to the Files area of the spectrumanalyzer
group.

File : /MSA WiringDiagram USB_RevA.pdf
Uploaded by : jghbeta <jghalpha@...>
Description : MSA WiringDiagram_USB

You can access this file at the URL:
http://groups.yahoo.com/group/spectrumanalyzer/files/MSA%20WiringDiagram%20USB_RevA.pdf

To learn more about file sharing for your group, please visit:
http://help.yahoo.com/l/us/yahoo/groups/original/members/web/index.html
Regards,

jghbeta <jghalpha@...>

8379. Re: [spectrumanalyzer] BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 21:18:31 UTC
From: william sprowls
Topic: 8375 Message: 8379

Dan,
The bandwidth is not important. You would like it as narrow as possible, but not narrower than the widest Resolution Filter you plan to use. Doubtful that you can get a BW of less than 1 MHz, anyway.
 The important specification is that the Image Frequency response must be at least -70 dBc, with -90 dBc as a goal. The more, the better. The present cavity filter is about -110 dBc.
The image frequency will always be:
Fimage = LO2 + Final IF
example: 1024 + 10.7 MHz + 1034.7 MHz

--- On Tue, 8/9/11, Dan Andersson <dan@...> wrote:

From: Dan Andersson <dan@andersson.co.uk>
Subject: [spectrumanalyzer] BW of filters
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, August 9, 2011, 3:04 PM

Sam,

What bandwith can you "get away with" when replacing the cavity filter?

I've been running a cople of iterations of milled filters now but with different

bandwidths.

//Dan, M0DFI

8380. Re: [spectrumanalyzer] USB update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 21:19:58 UTC
From: William Dillon
Topic: 6514 Message: 8380

Thanks Scotty.

The board should be here in a few days. I'll do basic testing to make sure I didn't screw anything major up. The minimum number of boards I can order from this factor is 10 (not bad at $2.50/ea). If it looks like they work O.K., I'll have extras. If anyone is interested let me know, off-list is probably best.

- Will

On Aug 9, 2011, at 2:08 PM, william sprowls wrote:

> Hi William,
> Yes, that document is valid. Since then, proposed modules have been added to the MSA as optional items. These will take up the bits that this document calls "spares". These include:
> RF Band Switch for B1/B2/B3
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> To: spectrumanalyzer@yahoogroups.com
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8381. Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 21:29:49 UTC
From: Sam
Topic: 8375 Message: 8381

We usually talk in terms of a 3 dB bandwidth of 2-3 MHz, but in fact the most important specification is that you get good attenuation (hopefully better than 90 dB) at 2*IF2 above the center frequency. With Scotty's cavity design, the two go together to some extent--if you have a 3 dB bandwidth of 5 MHz you probably won't do well at +2*IF2. But another design might function differently.

Here are some things I recall from experimenting:

If you compare a perfect filter to one that is somewhat overcoupled, the S21 response of the overcoupled filter is shifted upward, but the top hits a ceiling and flattens out. The effect is a significant widening of the 3 dB bandwidth, with only a couple dB effect on attenuation at +2*IF2, so perhaps no harm is done. (An undercoupled filter will have a sharp peak, but the insertion loss will be high (i.e. the top of the peak will not be as high as you want.)

Slight tweaking of the tuning of a resonator can significantly affect the peak, so if you rely entirely on getting the dimensions exactly right, without tuning ability, you are not likely to have much success.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:
>
> Sam,
>
> What bandwith can you "get away with" when replacing the cavity filter?
>
> I've been running a cople of iterations of milled filters now but with different
> bandwidths.
>
> //Dan, M0DFI
>

8382. Re: [spectrumanalyzer] BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 21:34:43 UTC
From: Dan Andersson
Topic: 8375 Message: 8382

The bandwidth is my main concern right now. The low side is -150 dB down and very steep and that is good for a PCB Intedigital filter. I can intruduce tuning screws in the lid if I need to further finetune the filter. With 10MHz BW, the "quality" of FR4 driblles the centre frequency allover the place between samples.

I'm trying to stay within 80 by 50 mm size so I'm not targeting anything elaborate.

//dan

On Tuesday 09 August 2011 22:18:31 you wrote:
> Dan,
> The bandwidth is not important. You would like it as narrow as possible,
> but not narrower than the widest Resolution Filter you plan to use.
> Doubtful that you can get a BW of less than 1 MHz, anyway. The important
> specification is that the Image Frequency response must be at least -70
> dBc, with -90 dBc as a goal. The more, the better. The present cavity
> filter is about -110 dBc. The image frequency will always be:
> Fimage = LO2 + Final IF
> example: 1024 + 10.7 MHz + 1034.7 MHz
>
> --- On Tue, 8/9/11, Dan Andersson <dan@...> wrote:
>
> From: Dan Andersson <dan@...>
> Subject: [spectrumanalyzer] BW of filters
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, August 9, 2011, 3:04 PM
>
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>
> Sam,

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>
>
> What bandwith can you "get away with" when replacing the cavity filter?
>
>
>
> I've been running a cople of iterations of milled filters now but with
> different
>
> bandwidths.
>
>
>
> //Dan, M0DFI

8383. Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 21:37:39 UTC
From: Sam
Topic: 8375 Message: 8383

To clarify: Scotty refers to the image frequency at LO2+IF2. The cavity filter center (Fc) is LO2-IF2. So my Fc+2*IF2 is the same as Scotty's LO2+IF2. BTW, I believe the reason the image has that name is that it is the "reflection" of Fc through LO2. Just as an optical image in a mirror is the same distance behind the mirror that the object is in front of the mirror, the image frequency is the same distance above LO2 as the target frequency is below LO2.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> We usually talk in terms of a 3 dB bandwidth of 2-3 MHz, but in fact the most important specification is that you get good attenuation (hopefully better than 90 dB) at 2*IF2 above the center frequency. With Scotty's cavity design, the two go together to some extent--if you have a 3 dB bandwidth of 5 MHz you probably won't do well at +2*IF2. But another design might function differently.
>
> Here are some things I recall from experimenting:
>
> If you compare a perfect filter to one that is somewhat overcoupled, the S21 response of the overcoupled filter is shifted upward, but the top hits a ceiling and flattens out. The effect is a significant widening of the 3 dB bandwidth, with only a couple dB effect on attenuation at +2*IF2, so perhaps no harm is done. (An undercoupled filter will have a sharp peak, but the insertion loss will be high (i.e. the top of the peak will not be as high as you want.)
>
> Slight tweaking of the tuning of a resonator can significantly affect the peak, so if you rely entirely on getting the dimensions exactly right, without tuning ability, you are not likely to have much success.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@> wrote:
> >
> > Sam,
> >
> > What bandwith can you "get away with" when replacing the cavity filter?
> >
> > I've been running a cople of iterations of milled filters now but with different
> > bandwidths.
> >
> > //Dan, M0DFI
> >
>

8384. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 22:22:43 UTC
From: Dan Andersson
Topic: 8375 Message: 8384

On Tuesday 09 August 2011 22:37:39 you wrote:
> hopefully better than 90 dB) at 2*IF2 above the center frequency

Well,

I have better attenuation below the centrefrequency.

To be absolutely frank, I think it will be hard to replace a cavity filter with any PCB based solution.

I'll give the PCB filter some time before I start making a reproducable cavity filter. It's the bandwidth that is the PCB caveat.

//Dan

8385. Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-09 23:18:01 UTC
From: Sam
Topic: 8375 Message: 8385

I believe a major issue with a PCB solution is that it uses flat resonators. One might think that microstrip lines are wide enough that, even with skin-effect limiting current flow to the (bottom) surface, the resistance would not be too bad. But in microstrip, the same forces that cause skin-effect tend to push the current to the edges of the strip. So the current can't take full advantage of the surface area. That means more resistance, more loss, and wider bandwidths.

The other issue is dielectric loss, which can be alleviated with expensive substrates, but I don't think there is any way around the flat resonator problem. It's hard for a 0.1" wide strip to compete with a 0.25" diameter rod.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:
>
> On Tuesday 09 August 2011 22:37:39 you wrote:
> > hopefully better than 90 dB) at 2*IF2 above the center frequency
>
> Well,
>
> I have better attenuation below the centrefrequency.
>
> To be absolutely frank, I think it will be hard to replace a cavity filter with
> any PCB based solution.
>
> I'll give the PCB filter some time before I start making a reproducable cavity
> filter. It's the bandwidth that is the PCB caveat.
>
> //Dan
>

8386. PDM Inversion Calibration

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-10 01:50:56 UTC
From: jghbeta
Topic: 8386 Message: 8386

While following the procedure to perform this calibration I am consistently getting values close to 360 degrees insteada of 180.
Has anything changed or am I missing something?

Jim W1JGH

8387. Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-10 03:30:28 UTC
From: inlinebeginner
Topic: 8375 Message: 8387

Sam
Can we apply your Ampfilter concept to this microstrip line cavity filter? It could compensate the loss, and make more stages.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I believe a major issue with a PCB solution is that it uses flat resonators. One might think that microstrip lines are wide enough that, even with skin-effect limiting current flow to the (bottom) surface, the resistance would not be too bad. But in microstrip, the same forces that cause skin-effect tend to push the current to the edges of the strip. So the current can't take full advantage of the surface area. That means more resistance, more loss, and wider bandwidths.
>
> The other issue is dielectric loss, which can be alleviated with expensive substrates, but I don't think there is any way around the flat resonator problem. It's hard for a 0.1" wide strip to compete with a 0.25" diameter rod.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@> wrote:
> >
> > On Tuesday 09 August 2011 22:37:39 you wrote:
> > > hopefully better than 90 dB) at 2*IF2 above the center frequency
> >
> > Well,
> >
> > I have better attenuation below the centrefrequency.
> >
> > To be absolutely frank, I think it will be hard to replace a cavity filter with
> > any PCB based solution.
> >
> > I'll give the PCB filter some time before I start making a reproducable cavity
> > filter. It's the bandwidth that is the PCB caveat.
> >
> > //Dan
> >
>

8388. Re: PDM Inversion Calibration

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-10 11:58:20 UTC
From: Sam
Topic: 8386 Message: 8388

Nothing on that has changed for quite a while. I wonder whether the PDM is actually getting the inversion signal?
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> While following the procedure to perform this calibration I am consistently getting values close to 360 degrees insteada of 180.
> Has anything changed or am I missing something?
>
> Jim W1JGH
>

8389. Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-10 12:05:27 UTC
From: Sam
Topic: 8375 Message: 8389

An amplifier can compensate for insertion loss, but not for the broadening of filter response that is caused by low Q.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> Can we apply your Ampfilter concept to this microstrip line cavity filter? It could compensate the loss, and make more stages.
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > I believe a major issue with a PCB solution is that it uses flat resonators. One might think that microstrip lines are wide enough that, even with skin-effect limiting current flow to the (bottom) surface, the resistance would not be too bad. But in microstrip, the same forces that cause skin-effect tend to push the current to the edges of the strip. So the current can't take full advantage of the surface area. That means more resistance, more loss, and wider bandwidths.
> >
> > The other issue is dielectric loss, which can be alleviated with expensive substrates, but I don't think there is any way around the flat resonator problem. It's hard for a 0.1" wide strip to compete with a 0.25" diameter rod.
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@> wrote:
> > >
> > > On Tuesday 09 August 2011 22:37:39 you wrote:
> > > > hopefully better than 90 dB) at 2*IF2 above the center frequency
> > >
> > > Well,
> > >
> > > I have better attenuation below the centrefrequency.
> > >
> > > To be absolutely frank, I think it will be hard to replace a cavity filter with
> > > any PCB based solution.
> > >
> > > I'll give the PCB filter some time before I start making a reproducable cavity
> > > filter. It's the bandwidth that is the PCB caveat.
> > >
> > > //Dan
> > >
> >
>

8390. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-10 12:18:39 UTC
From: Dan Andersson
Topic: 8375 Message: 8390

Yes, but...

No amplifier in the world can compensate for lost low level signals.

Lost is lost.

Sure, you can run a cooled amplifier to lift up the signals from the noise like
in radio telecope setups but realistacally - no.

Who have a free supply of nitrogen nowadays?

//Dan

On Wednesday 10 August 2011 13:05:27 you wrote:
> An amplifier can compensate for insertion loss, but not for the broadening
> of filter response that is caused by low Q. Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner"
<inlinebeginner@...> wrote:
> > Sam
> >
> > Can we apply your Ampfilter concept to this microstrip line cavity
> > filter? It could compensate the loss, and make more stages.
> >
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > I believe a major issue with a PCB solution is that it uses flat
> > > resonators. One might think that microstrip lines are wide enough
> > > that, even with skin-effect limiting current flow to the (bottom)
> > > surface, the resistance would not be too bad. But in microstrip, the
> > > same forces that cause skin-effect tend to push the current to the
> > > edges of the strip. So the current can't take full advantage of the
> > > surface area. That means more resistance, more loss, and wider
> > > bandwidths.
> > >
> > > The other issue is dielectric loss, which can be alleviated with
> > > expensive substrates, but I don't think there is any way around the
> > > flat resonator problem. It's hard for a 0.1" wide strip to compete
> > > with a 0.25" diameter rod.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@> wrote:
> > > > On Tuesday 09 August 2011 22:37:39 you wrote:
> > > > > hopefully better than 90 dB) at 2*IF2 above the center frequency

> > > >
> > > > Well,
> > > >
> > > > I have better attenuation below the centrefrequency.
> > > >
> > > > To be absolutely frank, I think it will be hard to replace a cavity
> > > > filter with any PCB based solution.
> > > >
> > > > I'll give the PCB filter some time before I start making a
> > > > reproducable cavity filter. It's the bandwidth that is the PCB
> > > > caveat.
> > > >
> > > > //Dan

8391. Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-10 12:54:07 UTC
From: Sam
Topic: 8375 Message: 8391

In the amplifilter, the amplifier is in the middle. It can't recover signals lost to the noise in the first half, but it can boost the remaining signals so they don't get lost in the noise in the second half. So it partially saves signals from getting lost. But that is just gravy; its main purpose is to prevent interaction between the two halves, which pretty much eliminates the need for tuning, and eliminates ripple.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:
>
>
> Yes, but...
>
> No amplifier in the world can compensate for lost low level signals.
>
> Lost is lost.
>
> Sure, you can run a cooled amplifier to lift up the signals from the noise like
> in radio telecope setups but realistacally - no.
>
> Who have a free supply of nitrogen nowadays?
>
> //Dan
>
> On Wednesday 10 August 2011 13:05:27 you wrote:
> > An amplifier can compensate for insertion loss, but not for the broadening
> > of filter response that is caused by low Q. Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner"
> <inlinebeginner@> wrote:
> > > Sam
> > >
> > > Can we apply your Ampfilter concept to this microstrip line cavity
> > > filter? It could compensate the loss, and make more stages.
> > >
> > > Lin
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > I believe a major issue with a PCB solution is that it uses flat
> > > > resonators. One might think that microstrip lines are wide enough
> > > > that, even with skin-effect limiting current flow to the (bottom)
> > > > surface, the resistance would not be too bad. But in microstrip, the
> > > > same forces that cause skin-effect tend to push the current to the
> > > > edges of the strip. So the current can't take full advantage of the
> > > > surface area. That means more resistance, more loss, and wider
> > > > bandwidths.

> > > >
> > > > The other issue is dielectric loss, which can be alleviated with
> > > > expensive substrates, but I don't think there is any way around the
> > > > flat resonator problem. It's hard for a 0.1" wide strip to compete
> > > > with a 0.25" diameter rod.
> > > >
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@> wrote:
> > > > > On Tuesday 09 August 2011 22:37:39 you wrote:
> > > > > > hopefully better than 90 dB) at 2*IF2 above the center frequency
> > > > >
> > > > > Well,
> > > > >
> > > > > I have better attenuation below the centrefrequency.
> > > > >
> > > > > To be absolutely frank, I think it will be hard to replace a cavity
> > > > > filter with any PCB based solution.
> > > > >
> > > > > I'll give the PCB filter some time before I start making a
> > > > > reproducable cavity filter. It's the bandwidth that is the PCB
> > > > > caveat.
> > > > >
> > > > > //Dan
>

8392. Re: [spectrumanalyzer] BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-10 13:28:43 UTC
From: William Dillon
Topic: 8375 Message: 8392

So, while we're on the topic of cavity filters...

I've seen some topologies that use a bandpass filter for the desired pass band, and another band pass filter for the desired rejection band. The filter that selects the rejection band is terminated in a dummy load. The idea is to absorb the energy in the rejection band to increase the isolation. I think that the two filters are connected using a coax tee at the input. Does something like that even work?

- Will

On Aug 10, 2011, at 5:05 AM, Sam wrote:

> An amplifier can compensate for insertion loss, but not for the broadening of filter response that is caused by low Q.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
> >
> > Sam
> > Can we apply your Ampfilter concept to this microstrip line cavity filter? It could compensate the loss, and make more stages.
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > I believe a major issue with a PCB solution is that it uses flat resonators. One might think that microstrip lines are wide enough that, even with skin-effect limiting current flow to the (bottom) surface, the resistance would not be too bad. But in microstrip, the same forces that cause skin-effect tend to push the current to the edges of the strip. So the current can't take full advantage of the surface area. That means more resistance, more loss, and wider bandwidths.
> > >
> > > The other issue is dielectric loss, which can be alleviated with expensive substrates, but I don't think there is any way around the flat resonator problem. It's hard for a 0.1" wide strip to compete with a 0.25" diameter rod.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@> wrote:
> > > >
> > > > On Tuesday 09 August 2011 22:37:39 you wrote:
> > > > > hopefully better than 90 dB) at 2*IF2 above the center frequency
> > > >
> > > > Well,
> > > >
> > > > I have better attenuation below the centrefrequency.

> > > >
> > > > To be absolutely frank, I think it will be hard to replace a cavity filter with
> > > > any PCB based solution.
> > > >
> > > > I'll give the PCB filter some time before I start making a reproducable cavity
> > > > filter. It's the bandwidth that is the PCB caveat.
> > > >
> > > > //Dan
> > > >
> > >
> >
>
>

8393. Re: [spectrumanalyzer] Re: PDM Inversion Calibration

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-10 13:37:24 UTC
From: Jim Hontoria
Topic: 8386 Message: 8393

Thanks Sam,
I had port E6 instead of D6. Now it works fine.

Jim W1JGH

On Wed, Aug 10, 2011 at 7:58 AM, Sam <swetterlin@...> wrote:

> **
>
>
> Nothing on that has changed for quite a while. I wonder whether the PDM is
> actually getting the inversion signal?
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
> >
> > While following the procedure to perform this calibration I am
> consistently getting values close to 360 degrees insteada of 180.
> > Has anything changed or am I missing something?
> >
> > Jim W1JGH
> >
>
>
>

--
Jim G. Hontoria

8394. Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-10 14:42:12 UTC
From: Sam
Topic: 8375 Message: 8394

Good thought. I don't know enough about it to know whether that particular arrangement is feasible, but it certainly is possible to supplement the cavity filter with a band rejection mechanism. The trick would be to do it in a way that makes the overall filter simpler. Perhaps a microstrip band rejection filter would be effective enough that you could get by with a 2- or 3- stage cavity filter. The rejection would have to be modest(30-40 dB?) at 2*IF2 above 1013.3 MHz, without having much effect at 1013.3 MHz. Those requirements don't seem too demanding. Maybe even a "coax stub" could do the trick, if the "coax" were low loss--such as being constructed like a stage of the cavity filter (but no coupling coils would be needed, and maybe the pipes could be smaller diameter).

I built a similar trap filter for 1045 MHz, using a thru line between two SMA connectors, with an open coax (0.141") connected to the line through a 2.5 pF capacitor. The capacitor greatly sharpens the response (and provides some tuning ability), so I got 35 dB attenuation at 1045 MHz but only a couple dB at 1 GHz. Simulations showed that I could do much better with a smaller capacitor if the coax were lower loss.

Conceivably, the fact that the cavity filter return loss will be far from 50 ohms at the image frequency complicates things.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> So, while we're on the topic of cavity filters...
>
> I've seen some topologies that use a bandpass filter for the desired pass band, and another band pass filter for the desired rejection band. The filter that selects the rejection band is terminated in a dummy load. The idea is to absorb the energy in the rejection band to increase the isolation. I think that the two filters are connected using a coax tee at the input. Does something like that even work?
>
> - Will
>
>

8395. Re: [spectrumanalyzer] BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-10 15:45:54 UTC
From: William Dillon
Topic: 8375 Message: 8395

That was definitely a sticking point I thought of (the impedance match). I don't remember the context, but I remember that there was some wizardry related to making the impedances work out correctly such that the insertion loss was low and there weren't reflections from the image.

- Will

On Aug 10, 2011, at 7:42 AM, Sam wrote:

> Good thought. I don't know enough about it to know whether that particular arrangement is feasible, but it certainly is possible to supplement the cavity filter with a band rejection mechanism. The trick would be to do it in a way that makes the overall filter simpler. Perhaps a microstrip band rejection filter would be effective enough that you could get by with a 2- or 3- stage cavity filter. The rejection would have to be modest(30-40 dB?) at 2*IF2 above 1013.3 MHz, without having much effect at 1013.3 MHz. Those requirements don't seem too demanding. Maybe even a "coax stub" could do the trick, if the "coax" were low loss--such as being constructed like a stage of the cavity filter (but no coupling coils would be needed, and maybe the pipes could be smaller diameter).
>
> I built a similar trap filter for 1045 MHz, using a thru line between two SMA connectors, with an open coax (0.141") connected to the line through a 2.5 pF capacitor. The capacitor greatly sharpens the response (and provides some tuning ability), so I got 35 dB attenuation at 1045 MHz but only a couple dB at 1 GHz. Simulations showed that I could do much better with a smaller capacitor if the coax were lower loss.
>
> Conceivably, the fact that the cavity filter return loss will be far from 50 ohms at the image frequency complicates things.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
> >
> > So, while we're on the topic of cavity filters...
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> > I've seen some topologies that use a bandpass filter for the desired pass band, and another band pass filter for the desired rejection band. The filter that selects the rejection band is terminated in a dummy load. The idea is to absorb the energy in the rejection band to increase the isolation. I think that the two filters are connected using a coax tee at the input. Does something like that even work?
> >
> > - Will
> >
> >
>
>

8396. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-10 21:14:21 UTC
From: Dan Andersson
Topic: 8375 Message: 8396
Attachments: 2 described; binary payloads are missing from this source WARC

Sam,

I've been toying with hairpin filters and there is a small possibility it will work.

I will not be able to produce the filter until end of next week so I attach the Gerber and CAM file if anyone else want to have a go while I'm away.

The filter will be difficult for homebrewers due to very(!) high demands on precision. I'm not a friend of hairpin filters but they do have little insertion loss and are very flat.

The 1013MHz is a bit on the low side for these kind of filters.

//Dan, M0DFI

On Wednesday 10 August 2011 15:42:12 you wrote:
> Good thought. I don't know enough about it to know whether that particular
> arrangement is feasible, but it certainly is possible to supplement the
> cavity filter with a band rejection mechanism. The trick would be to do it
> in a way that makes the overall filter simpler. Perhaps a microstrip band
> rejection filter would be effective enough that you could get by with a 2-
> or 3- stage cavity filter. The rejection would have to be modest(30-40
> dB?) at 2*IF2 above 1013.3 MHz, without having much effect at 1013.3 MHz.
> Those requirements don't seem too demanding. Maybe even a "coax stub"
> could do the trick, if the "coax" were low loss--such as being constructed
> like a stage of the cavity filter (but no coupling coils would be needed,
> and maybe the pipes could be smaller diameter).
>
> I built a similar trap filter for 1045 MHz, using a thru line between two
> SMA connectors, with an open coax (0.141") connected to the line through a
> 2.5 pF capacitor. The capacitor greatly sharpens the response (and
> provides some tuning ability), so I got 35 dB attenuation at 1045 MHz but
> only a couple dB at 1 GHz. Simulations showed that I could do much better
> with a smaller capacitor if the coax were lower loss.
>
> Conceivably, the fact that the cavity filter return loss will be far from
> 50 ohms at the image frequency complicates things.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
> > So, while we're on the topic of cavity filters...
> >
> > I've seen some topologies that use a bandpass filter for the desired

> > pass band, and another band pass filter for the desired rejection band.
> > The filter that selects the rejection band is terminated in a dummy
> > load. The idea is to absorb the energy in the rejection band to
> > increase the isolation. I think that the two filters are connected
> > using a coax tee at the input. Does something like that even work?
> >
> > - Will

8397. Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-11 18:19:52 UTC
From: inlinebeginner
Topic: 8375 Message: 8397

Dan
Have you ever tried toner transfer? From your gerber file, I did not see any connector, where do you connect to? The most left and right copper? FR-4 1.6mm thickness two layer PCB? or top layer only?
Lin

--- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:>
>
> Sam,
>
> I've been toying with hairpin filters and there is a small possibility it will
> work.
>
> I will not be able to produce the filter until end of next week so I attach
> the Gerber and CAM file if anyone else want to have a go while I'm away.
>
> The filter will be difficult for homebrewers due to very(!) high demands on
> precision. I'm not a friend of hairpin filters but they do have little
> insertion loss and are very flat.
>
> The 1013MHz is a bit on the low side for these kind of filters.
>
> //Dan, M0DFI
>
>
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> On Wednesday 10 August 2011 15:42:12 you wrote:
> > Good thought. I don't know enough about it to know whether that particular
> > arrangement is feasible, but it certainly is possible to supplement the
> > cavity filter with a band rejection mechanism. The trick would be to do it
> > in a way that makes the overall filter simpler. Perhaps a microstrip band
> > rejection filter would be effective enough that you could get by with a 2-
> > or 3- stage cavity filter. The rejection would have to be modest(30-40
> > dB?) at 2*IF2 above 1013.3 MHz, without having much effect at 1013.3 MHz.
> > Those requirements don't seem too demanding. Maybe even a "coax stub"
> > could do the trick, if the "coax" were low loss--such as being constructed
> > like a stage of the cavity filter (but no coupling coils would be needed,
> > and maybe the pipes could be smaller diameter).
> >
> > I built a similar trap filter for 1045 MHz, using a thru line between two
> > SMA connectors, with an open coax (0.141") connected to the line through a
> > 2.5 pF capacitor. The capacitor greatly sharpens the response (and
> > provides some tuning ability), so I got 35 dB attenuation at 1045 MHz but
> > only a couple dB at 1 GHz. Simulations showed that I could do much better
> > with a smaller capacitor if the coax were lower loss.

> >
> > Conceivably, the fact that the cavity filter return loss will be far from
> > 50 ohms at the image frequency complicates things.
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@> wrote:
> > > So, while we're on the topic of cavity filters...
> > >
> > > I've seen some topologies that use a bandpass filter for the desired
> > > pass band, and another band pass filter for the desired rejection band.
> > > The filter that selects the rejection band is terminated in a dummy
> > > load. The idea is to absorb the energy in the rejection band to
> > > increase the isolation. I think that the two filters are connected
> > > using a coax tee at the input. Does something like that even work?
> > >
> > > - Will
>

8398. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-11 20:02:11 UTC
From: Dan Andersson
Topic: 8375 Message: 8398

On Thursday 11 August 2011 19:19:52 you wrote:
> Dan
> Have you ever tried toner transfer? From your gerber file, I did not see
> any connector, where do you connect to? The most left and right copper?
> FR-4 1.6mm thickness two layer PCB? or top layer only? Lin
>
> --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:>
>

Toner transfer? Nahh. Expensive and unreliable

But I have a CNC milling machine with accuracy better than 0.0002" :)
(www.lumenlab.com)

FR4. 0.8mm !!!!!!!!! and two layer of course.

Port 1, left just above the lower end 5 to 10mm up
Port 2, Right just below the UPPER end, 5 to 10mm down

//Dan

8399. PLO1 & 3 with 4112

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-11 20:58:23 UTC
From: radiotalk@xtra.co.nz
Topic: 8399 Message: 8399

Hi Sam / Scotty

I'm using the compiled 116L while commissioning by MSA. I cannot seem to get the 4112's to command ie no output from U2-2?

I have spent many hours rechecking components & wiring and all voltages etc look ok except the PLO locking. The VCO U4 sits at 800-900MHz whether on sweep or pause. I have the additional resistor added at U2-1.

Also the title bar of the software says 116 ver F not L (completely new install)?

Any help appreciated.

Chris

8400. Re: [spectrumanalyzer] PLO1 & 3 with 4112

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-12 02:04:39 UTC
From: Jim Hontoria
Topic: 8399 Message: 8400

Hi Cris,
Have you set the Configuration Manager to utilize the 4112 instead of the 2326?

Jim W1JGH

On Thu, Aug 11, 2011 at 4:58 PM, radiotalk@xtra.co.nz <
chris@...> wrote:

> **
>
>
> Hi Sam / Scotty
>
> I'm using the compiled 116L while commissioning by MSA. I cannot seem to
> get the 4112's to command ie no output from U2-2?
>
> I have spent many hours rechecking components & wiring and all voltages etc
> look ok except the PLO locking. The VCO U4 sits at 800-900MHz whether on
> sweep or pause. I have the additional resistor added at U2-1.
>
> Also the title bar of the software says 116 ver F not L (completely new
> install)?
>
> Any help appreciated.
>
> Chris
>
>
>

--
Jim G. Hontoria

8401. Re: PLO1 & 3 with 4112

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-12 02:42:51 UTC
From: william
Topic: 8399 Message: 8401

Hi Cris,
I also noticed the title is incorrect. It didn't get changed in the upgrades.
If all 3 PLO's are not locking, I would tend to believe that the PLO's are not getting the correct command.
Does the AtoD work and give a Magnitude trace on the graph? It may be below -100 dBm so change the Mag scale to look down to -130 dBm. If it does, the LPT is "talking and listening" correctly.
Scotty

--- In spectrumanalyzer@yahoogroups.com, "radiotalk@..." <chris@...> wrote:
>
> Hi Sam / Scotty
>
> I'm using the compiled 116L while commissioning by MSA. I cannot seem to get the 4112's to command ie no output from U2-2?
>
> I have spent many hours rechecking components & wiring and all voltages etc look ok except the PLO locking. The VCO U4 sits at 800-900MHz whether on sweep or pause. I have the additional resistor added at U2-1.
>
> Also the title bar of the software says 116 ver F not L (completely new install)?
>
> Any help appreciated.
>
> Chris
>

8402. Is there a kit with all components and pcbs for the spectrum analyzer availible?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-12 07:36:14 UTC
From: brettlejoe
Topic: 8402 Message: 8402

Hello,

I have a question to the spectrum analyzer: Is there a complete kit with all components and pcbs for the spectrum analyzer (in Europe?) availible? If so, where?

Thanks a lot for your help,
Harald

8403. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-13 23:41:50 UTC
From: R Wall
Topic: 8375 Message: 8403

Don't know if this is useful but there is some information on PC board filters here:

http://www.w6pql.com/pc_board_filters.htm

Roderick.

-----Original Message-----
From: Dan Andersson
Sent: Friday, August 12, 2011 6:02 AM
To: spectrumanalyzer@yahoogroups.com
Subject: Re: [spectrumanalyzer] Re: BW of filters

On Thursday 11 August 2011 19:19:52 you wrote:
> Dan
> Have you ever tried toner transfer? From your gerber file, I did not see
> any connector, where do you connect to? The most left and right copper?
> FR-4 1.6mm thickness two layer PCB? or top layer only? Lin
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> --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:>
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Toner transfer? Nahh. Expensive and unreliable

But I have a CNC milling machine with accuracy better than 0.0002" :)
(www.lumenlab.com)

FR4. 0.8mm !!!!!!!!! and two layer of course.

Port 1, left just above the lower end 5 to 10mm up
Port 2, Right just below the UPPER end, 5 to 10mm down

//Dan

Yahoo! Groups Links

No virus found in this message.
Checked by AVG - www.avg.com
Version: 10.0.1392 / Virus Database: 1520/3826 - Release Date: 08/10/11

8404. Re: PLO1 & 3 with 4112

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-14 02:55:20 UTC
From: radiotalk@xtra.co.nz
Topic: 8399 Message: 8404

Hi William

Sorry, I forgot to mention that PLO2 is commanded to 1024 OK. I have check as per the test that all latches on the control board are working. Data, clock & LE lines appear ok on my oscilloscope. The DDS boards are working as per the test procedures. The IF J3 back to ADC are all working fine.

Just PLO1 & 3 will not lock.

Cheers Chris

--- In spectrumanalyzer@yahoogroups.com, "william" <wsprowls@...> wrote:
>
> Hi Cris,
> I also noticed the title is incorrect. It didn't get changed in the upgrades.
> If all 3 PLO's are not locking, I would tend to believe that the PLO's are not getting the correct command.
> Does the AtoD work and give a Magnitude trace on the graph? It may be below -100 dBm so change the Mag scale to look down to -130 dBm. If it does, the LPT is "talking and listening" correctly.
> Scotty
>
> --- In spectrumanalyzer@yahoogroups.com, "radiotalk@" <chris@> wrote:
> >
> > Hi Sam / Scotty
> >
> > I'm using the compiled 116L while commissioning by MSA. I cannot seem to get the 4112's to command ie no output from U2-2?
> >
> > I have spent many hours rechecking components & wiring and all voltages etc look ok except the PLO locking. The VCO U4 sits at 800-900MHz whether on sweep or pause. I have the additional resistor added at U2-1.
> >
> > Also the title bar of the software says 116 ver F not L (completely new install)?
> >
> > Any help appreciated.
> >
> > Chris
> >
>

8405. Re: PLO1 & 3 with 4112

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-14 13:55:57 UTC
From: william
Topic: 8399 Message: 8405

Hi Chris and All,
The one thing that both PLO 1 and PLO 3 have in common, but different than PLO 2, is that they both require +20v.
Check the op amp, pin 7, for the +20v. Make certain the op amp, pin 4 is at ground. And, this may sound silly, but make certain the op amp is installed correctly. (One builder did flip it 180 degrees during installation).
Troubleshooting the MSA is a fairly easy process for me, since I know it so well. However, doing it using e-mails is tedious. Many group members had stated that they didn't mind witnessing a trouble shooting process, but it is still cumbersome.
When helping Jim H., he suggested I download "Skype" and use it "real time". It worked like a charm. We were able to troubleshoot very quickly. I would suggest that you get Skype, it's free and very easy to use. All you need is a high speed internet connection (DSL or faster) and a microphone connedted to your computer. An added web-cam is icing on the cake. My skype name is wsprowls. Just put me into your contact list and "call" me when you need help.
Scotty

--- In spectrumanalyzer@yahoogroups.com, "radiotalk@..." <chris@...> wrote:
>
> Hi William
>
> Sorry, I forgot to mention that PLO2 is commanded to 1024 OK. I have check as per the test that all latches on the control board are working. Data, clock & LE lines appear ok on my oscilloscope. The DDS boards are working as per the test procedures. The IF J3 back to ADC are all working fine.
>
> Just PLO1 & 3 will not lock.
>
> Cheers Chris
>
> --- In spectrumanalyzer@yahoogroups.com, "william" <wsprowls@> wrote:
> >
> > Hi Cris,
> > I also noticed the title is incorrect. It didn't get changed in the upgrades.
> > If all 3 PLO's are not locking, I would tend to believe that the PLO's are not getting the correct command.
> > Does the AtoD work and give a Magnitude trace on the graph? It may be below -100 dBm so change the Mag scale to look down to -130 dBm. If it does, the LPT is "talking and listening" correctly.
> > Scotty
> >
> > --- In spectrumanalyzer@yahoogroups.com, "radiotalk@" <chris@> wrote:
> > >
> > > Hi Sam / Scotty
> > >

> > > I'm using the compiled 116L while commissioning by MSA. I cannot seem to get the 4112's to command ie no output from U2-2?
> > >
> > > I have spent many hours rechecking components & wiring and all voltages etc look ok except the PLO locking. The VCO U4 sits at 800-900MHz whether on sweep or pause. I have the additional resistor added at U2-1.
> > >
> > > Also the title bar of the software says 116 ver F not L (completely new install)?
> > >
> > > Any help appreciated.
> > >
> > > Chris
> > >
> >
>

8406. Re: Is there a kit with all components and pcbs for the spectrum analyzer availible?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-15 20:04:56 UTC
From: brettlejoe
Topic: 8402 Message: 8406

Hello,

is there no kit for Scotty's spectrum analyzer availible?

--- In spectrumanalyzer@yahoogroups.com, "brettlejoe" <brettlejoe@...> wrote:
>
> Hello,
>
> I have a question to the spectrum analyzer: Is there a complete kit with all components and pcbs for the spectrum analyzer (in Europe?) availible? If so, where?
>
> Thanks a lot for your help,
> Harald
>

8407. Re: [spectrumanalyzer] Re: Is there a kit with all components and pcbs for the spectrum analyzer availible?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-15 20:37:03 UTC
From: Amos Ku
Topic: 8402 Message: 8407

I do think this kit will sell if turned into a complete kit.

However, in order to do that, some more things needed to be done to turn it into a commercial grade.

From: brettlejoe <brettlejoe@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Monday, August 15, 2011 1:04 PM
Subject: [spectrumanalyzer] Re: Is there a kit with all components and pcbs for the spectrum analyzer availible?

Hello,

is there no kit for Scotty's spectrum analyzer availible?

--- In spectrumanalyzer@yahoogroups.com, "brettlejoe" <brettlejoe@...> wrote:
>
> Hello,
>
> I have a question to the spectrum analyzer: Is there a complete kit with all components and pcbs for the spectrum analyzer (in Europe?) availible? If so, where?
>
> Thanks a lot for your help,
> Harald
>

8408. Re: [spectrumanalyzer] Re: Is there a kit with all components and pcbs for the spectrum analyzer availible?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-15 21:29:25 UTC
From: Geoff Moore
Topic: 8402 Message: 8408

Try Cash Olsen, he was doing some kitting.

The problem with a kit is you only get the exact number of parts required so when a part pings off the board as you are about to solder it in place, you have no spares and you end up spending hours crawling around on the floor looking for the missing part that is only costs a fraction of a penny / cent.

There are lists of components and Digikey part numbers available on the Yahoo site to help you order. OK, you may end up with a pack of 10 resistors when you only need 2 but they go into the spares box ready for the next project or you can swap or give them to someone else doing a build.

Geoff

----- Original Message -----
From: "Amos Ku" <amosku@...>
To: <spectrumanalyzer@yahoogroups.com>
Sent: Monday, August 15, 2011 9:37 PM
Subject: Re: [spectrumanalyzer] Re: Is there a kit with all components and pcbs for the spectrum analyzer availible?

I do think this kit will sell if turned into a complete kit.

However, in order to do that, some more things needed to be done to turn it into a commercial grade.

From: brettlejoe <brettlejoe@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Monday, August 15, 2011 1:04 PM
Subject: [spectrumanalyzer] Re: Is there a kit with all components and pcbs for the spectrum analyzer availible?

Hello,

is there no kit for Scotty's spectrum analyzer availible?

--- In spectrumanalyzer@yahoogroups.com, "brettlejoe" <brettlejoe@...>
wrote:
>
> Hello,
>
> I have a question to the spectrum analyzer: Is there a complete kit with
> all components and pcbs for the spectrum analyzer (in Europe?) availible?
> If so, where?

>
> Thanks a lot for your help,
> Harald
>

8409. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-19 21:33:16 UTC
From: Dan Andersson
Topic: 8375 Message: 8409

Back at the drawing board again.

I have been browsing the available internet resources on PCB based filters but very few are usable for us normal ham's without a doctorate in maths.

The 1.013GHz frequency is also a problem by being "too low" and that increases the size of some parts of the filters but makes other parts very tight due to the demand for low insertion loss and flatness.

I have a couple of hairpin solutions I will try this weekend. The problem is to design the filrŕers larger than my smallest mill bits.

There are also embarassingly little software help available for actual filter design. The choice seems to be for expensive software or ridicouluosly expensive software.

Luckily, I have access to one of these absurdly priced softwares and I get Gerber files as outputs. So I have a couple of alternatives to mill.

That said:

There are difficulties due to FR4 laminates varying from 4.1 to 4.7 so making more than one filter requires the material to be from the same batch.

Using any of the PCB houses for PCB filters is not as easy as other PCB's. You need a couple of itetations and then it can change because of a different FR4 batch or supplier.

Making the filter 5, 6 or fiftyleven pole makes no difference as it's only the the size that changes. Another important factor is the encapsulation.

They are very quick to mill.

I'll try to design a small footprint filter so I can decide for go or nogo regarding PCB filters and the SA build.

Amongst all othe delayed projecs - Sigh!

//Dan

On Sunday 14 August 2011 00:41:50 you wrote:
> Don't know if this is useful but there is some information on PC board
> filters here:
>
> http://www.w6pql.com/pc_board_filters.htm
>
> Roderick.
>

8410. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-20 03:20:32 UTC
From: william sprowls
Topic: 8375 Message: 8410

Hi Dan,
 I had been in the "business" for many years before computers and software only big corporations could afford. I found that microwave filter engineers specialized in that one thing and very little else. The really good ones could not walk and chew gum at the same time. If their lives depended on reading the color code of a resistor I would have been to many funerals. Even the very best designers had a basket full of rejects before finalizing a design. Don't fret too much, they really are the dark side of engineering.
Scotty

--- On Fri, 8/19/11, Dan Andersson <dan@...> wrote:

From: Dan Andersson <dan@...>
Subject: Re: [spectrumanalyzer] Re: BW of filters
To: spectrumanalyzer@yahoogroups.com
Date: Friday, August 19, 2011, 4:33 PM

Back at the drawing board again.

I have been browsing the available internet resources on PCB based filters but

very few are usable for us normal ham's without a doctorate in maths.

The 1.013GHz frequency is also a problem by being "too low" and that increases

the size of some parts of the filters but makes other parts very tight due to

the demand for low insertion loss and flatness.

I have a couple of hairpin solutions I will try this weekend. The problem is

to design the filrŕers larger than my smallest mill bits.

There are also embarassingly little software help available for actual filter

design. The choice seems to be for expensive software or ridicouluosly

expensive software.

Luckily, I have access to one of these absurdly priced softwares and I get

Gerber files as outputs. So I have a couple of alternatives to mill.

That said:

There are difficulties due to FR4 laminates varying from 4.1 to 4.7 so making

more than one filter requires the material to be from the same batch.

Using any of the PCB houses for PCB filters is not as easy as other PCB's. You

need a couple of itetations and then it can change because of a different FR4

batch or supplier.

Making the filter 5, 6 or fiftyleven pole makes no difference as it's only the

the size that changes. Another important factor is the encapsulation.

They are very quick to mill.

I'll try to design a small footprint filter so I can decide for go or nogo

regarding PCB filters and the SA build.

Amongst all othe delayed projecs - Sigh!

//Dan

On Sunday 14 August 2011 00:41:50 you wrote:

> Don't know if this is useful but there is some information on PC board

> filters here:

>

> http://www.w6pql.com/pc_board_filters.htm

>

> Roderick.

>

8411. Re: USB update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-20 04:19:50 UTC
From: radiotalk@xtra.co.nz
Topic: 6514 Message: 8411

Hi Jim

Does 1. SOFTWARE version L only apply to USB configurations or Parallel ports as well with 4112 charge pumps?

Chris

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> After a few intensive debugging sessions with the help of Scotty I got my the MSA working with 100% USB interface to my computer. 100% means that I don't use the control board at all. As far as I have been able to determine all functionality is there. The following summarizes what I have learnt and the changes that were required:
>
> 1. SOFTWARE. Version 116L does not require any changes to run USB with one exception: if you are using the 4112/4113 charge pumps in any of the PLO's, then a change must be made to the code. It will be incorporated into the next revision by Scotty.
>
> 2. USB INTERFACE: I use the EZUSB board with the 128 pin Cypress chip. It is available in eBay. Don't use a 56 pin chip or you will run out of ports. The drivers and instructions were posted to the group by Dave Roberts .
>
> 3. MSA HARDWARE MODIFICATIONS: The only changes have to do with the ADC board
>
> a) THE MUN2211 buffers must be changed to 2N7002 FETs. Each one must have a 10K pull down resistor from gate to ground and a 4K7 pull up resistor. A 100pF cap MAY be needed from gate to ground.
>
> b) In order to protect the USB chip ports when the board is not energized and the MSA starts, the power to the 2N7002 pull-up resistors MUST COME from the USB board (3.3 or 5 volts are available). Although the USB chip operates from 3.3 volts, its ports may accept up to 5.5 (I prefer 3.3 myself).
>
> c) The SERCLK and CONVERT lines must be decoupled with 100pF capacitors at the ADC board.
>
> I have prepared a 1.2x2.4 SLIM which includes the ADC and the video switch boards into one and incorporates all the changes described above. If there is any interest I'll do a small group buy. Just let me know.
>
> d) WIRING. Of course, all control wiring (boards PDM, ADC, PLO 1,2, 3, DDS 1, 3 and switches) has to be moved to the USB ports. I will post a wiring diagram in the files area although I believe that Scotty is going to do the same at his site. This sounds like a lot of work but gave the opportunity to clean up my snake's nest.
>
> 4. POWER SUPPLY
> The conventional power supply at the control board may continue to be used. For sake of

neatness I installed Sam W. power supply.
>
> I believe that's all
>
> Jim W1JGH
>

8412. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-20 07:40:28 UTC
From: Dan Andersson
Topic: 8375 Message: 8412

Hiya Scotty,

Yes, I know what you mean :)

I do have access to some absurdly priced magic software and I get decent results from it almost every time. And yes, some iterations is required every time I do a filter design as the dielectrical constant varies from supplier to supplier and even batch to batch.

I don't even try to do cavity filters, even with the software help. I remember they used to burn these kindof engineers on a stake in Halem as witches and magicians once upon a time)

But the main problem is that if I design (with fiftyleven iterations) a working filter based on my FR4 stock (bought cheaply from Poland), I doubt anyone can use the masures right off and procude a filter on the exact frequency of 1013MHz.

It's all right to make the design and then immediately produce a batch with that material. Fine if you are in the filter manufacturing business.

I broke my last 1mm fine end mill a week ago so I'll first try to design a filter with the minimum measureof 1.5mm somewhere. If that is not possible, I'll order some new mill bit on Monday.

I have some windows of opportunity for garage work this weekend and the upcoming week for this.

With some luck, I can design a "good enough" filter design, who knows...

Scotty,

What data would your "ideal" filter have?

//Dan

On Saturday 20 August 2011 04:20:32 you wrote:
> Hi Dan,
> I had been in the "business" for many years before computers and software
> only big corporations could afford. I found that microwave filter
> engineers specialized in that one thing and very little else. The really
> good ones could not walk and chew gum at the same time. If their lives
> depended on reading the color code of a resistor I would have been to many
> funerals. Even the very best designers had a basket full of rejects before
> finalizing a design. Don't fret too much, they really are the dark side of
> engineering. Scotty
>
> --- On Fri, 8/19/11, Dan Andersson <dan@...> wrote:

>
> From: Dan Andersson <dan@...>
> Subject: Re: [spectrumanalyzer] Re: BW of filters
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, August 19, 2011, 4:33 PM
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> There are difficulties due to FR4 laminates varying from 4.1 to 4.7 so
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>
> On Sunday 14 August 2011 00:41:50 you wrote:
> > Don't know if this is useful but there is some information on PC board
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> > filters here:
> >
> >
> >
> > http://www.w6pql.com/pc_board_filters.htm
> >
> >
> >
> > Roderick.

8413. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-20 11:51:15 UTC
From: Jurgen
Topic: 8375 Message: 8413

You might want to consider that FR4 is an unstable substrate. Its parameters vary with temperature, moisture content and temperature. They vary widely from batch to batch. You might want to consider backing the substrate prior to any usage and sealing it after you are finished. I have no idea of how critical the above is to your design, but I think they are worth considering.

Jurgen

On 8/19/2011 5:33 PM, Dan Andersson wrote:
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> filters but
> very few are usable for us normal ham's without a doctorate in maths.
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> The 1.013GHz frequency is also a problem by being "too low" and that
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> the size of some parts of the filters but makes other parts very tight
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> the demand for low insertion loss and flatness.
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> Making the filter 5, 6 or fiftyleven pole makes no difference as it's
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> I'll try to design a small footprint filter so I can decide for go or
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> Amongst all othe delayed projecs - Sigh!
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> On Sunday 14 August 2011 00:41:50 you wrote:
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> > http://www.w6pql.com/pc_board_filters.htm
> >
> > Roderick.
> >
>
>

8414. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-20 12:04:07 UTC
From: Dan Andersson
Topic: 8375 Message: 8414

Jurgen,

The filter needs a box with 10mm space above the surface and 10mm around. I will probably make a "proper" milled box if theis works out. That should keep the moisture within workabe ranges and in worst case, I can make an oven out of it with rather simple means.

However,

If it works out nicely, I do have a batch of Rogers around in the shack. I just don't want to "waste" it while testing stuff.

I have a decent VNA so I will be able to abuse the design a bit...

//Dan

On Saturday 20 August 2011 12:51:15 you wrote:
> You might want to consider that FR4 is an unstable substrate. Its
> parameters vary with temperature, moisture content and temperature.
> They vary widely from batch to batch. You might want to consider backing
> the substrate prior to any usage and sealing it after you are finished.
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> > > Roderick.

8415. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-20 12:38:39 UTC
From: Jurgen
Topic: 8375 Message: 8415

Dan,

My suggestion would be to bake the material prior to usage.
I used to work in Telecom and Automotive. We considered FR4 as a sponge.
When we used Fr4 in controlled impedance applications after receiving
the substrate we baked it under vacuum for 72 Hrs @ ~115 degrees C.
I realize that this is not possible but shows the importance.
I also worked on a project in Automotive attemting to replace ceramic
substrates with FR4 and run into the same issues.
My suggestion would be to bake the substrate, make sure not exceed the
temperature do your milling etc. and then seal the substrate with
conformal coating.
This may have the undesirable side effect of changing the filter
characteristics, I don't know.

Jurgen

On 8/20/2011 8:04 AM, Dan Andersson wrote:
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> Jurgen,
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> The filter needs a box with 10mm space above the surface and 10mm
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8416. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-20 13:02:39 UTC
From: Dan Andersson
Topic: 8375 Message: 8416

Well Jurgen

I'm not going to build a satellite nor any nuclear device :)

The test is to see if I can achieve the bandwidth of a cavity filter, with as many of the cavity filters benefits as possible - but with a PCB.
I'm targeting a "good enough" design here.

I have a design ready now for an initial prototype and I'm going to th garage to start up the cnc mill in a bit.

If I can achieve the basic attenuation and bandwidth independently on where the Fo ends up, it's enough to allow for measurements.

Another question as you brought it up. What is the humidity and temp behaviour of the "cheapo" (bad wording, I know...) built cavity filters in use now?

If the PCB design shows a reasonable fit in that deviation curve, it's good enough.

The nitty gritty of any deviations is the centre frequency and insertion loss. If these two values (the first s most important) is stable enough to use, so be it.

Also, bear in mind that you need to calibrate your SA after it settled in the lab/shack. That should keep it stable enough during the works and measuring - as long as the XYL doesn't open the window (eek! Fresh air!) or you run silly with the linear and creates a sauna environment.

And if you need to recalibrate the SA every day or even twice a day, so be it...

This means I need to mill the PCB at "normal" temp and humidity... :) Imagine, a filter that works only on the UK East coast...

//Dan

On Saturday 20 August 2011 13:38:39 you wrote:
> Dan,
>
> My suggestion would be to bake the material prior to usage.
> I used to work in Telecom and Automotive. We considered FR4 as a sponge.
> When we used Fr4 in controlled impedance applications after receiving
> the substrate we baked it under vacuum for 72 Hrs @ ~115 degrees C.
> I realize that this is not possible but shows the importance.
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> substrates with FR4 and run into the same issues.
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> temperature do your milling etc. and then seal the substrate with
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8417. Re: [spectrumanalyzer] Re: Is there a kit with all components and pcbs for the spectrum analyzer availible?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-20 13:33:42 UTC
From: Hector Pascal
Topic: 8402 Message: 8417

Last time I looked at buying from Digikey or Mouser, they would only ship outside ConUS if you paid Courier prices. $35 per shipment put me off buying $50 worth!

David, VK6JT

8418. RE: [spectrumanalyzer] Re: Is there a kit with all components and pcbs for the spectrum analyzer availible?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-20 15:13:18 UTC
From: Mark Burgin
Topic: 8402 Message: 8418

Actually Digikey's international shipment cost to the UK is quite reasonable. It is £12 (about $19) for orders less than £50 and FREE for orders greater than £50. Unfortunately, in the UK we have to pay VAT on everything which adds another 20%.
I have never tried Mouser so I can't comment on their costs.
Mark

From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of Hector Pascal
Sent: 20 August 2011 14:34
To: spectrumanalyzer@yahoogroups.com
Subject: Re: [spectrumanalyzer] Re: Is there a kit with all components and pcbs for the spectrum analyzer availible?

Last time I looked at buying from Digikey or Mouser, they would only ship outside ConUS if you paid Courier prices. $35 per shipment put me off buying $50 worth!

David, VK6JT

8419. Re: USB update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-20 18:53:05 UTC
From: Sam
Topic: 6514 Message: 8419

The latest beta, which is beta version "F" but is titled MSA_version116-4L and is posted in the Files section, handles all configurations, except that we have an unreleased bug fix relating to the use of 4112-type PLLs when using USB to directly control the modules (i.e. no control board). We don't have separate versions of the software for different hardware configurations. I think we will soon be able to release the final software, which will revert to the name "spectrumanalyzer.bas" rather than the form MSA_version116-xx.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "radiotalk@..." <chris@...> wrote:
>
> Hi Jim
>
> Does 1. SOFTWARE version L only apply to USB configurations or Parallel ports as well with 4112 charge pumps?
>
> Chris
>
> --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
> >
> > After a few intensive debugging sessions with the help of Scotty I got my the MSA working with 100% USB interface to my computer. 100% means that I don't use the control board at all. As far as I have been able to determine all functionality is there. The following summarizes what I have learnt and the changes that were required:
> >
> > 1. SOFTWARE. Version 116L does not require any changes to run USB with one exception: if you are using the 4112/4113 charge pumps in any of the PLO's, then a change must be made to the code. It will be incorporated into the next revision by Scotty.
> >
> > 2. USB INTERFACE: I use the EZUSB board with the 128 pin Cypress chip. It is available in eBay. Don't use a 56 pin chip or you will run out of ports. The drivers and instructions were posted to the group by Dave Roberts .
> >
> > 3. MSA HARDWARE MODIFICATIONS: The only changes have to do with the ADC board
> >
> > a) THE MUN2211 buffers must be changed to 2N7002 FETs. Each one must have a 10K pull down resistor from gate to ground and a 4K7 pull up resistor. A 100pF cap MAY be needed from gate to ground.
> >
> > b) In order to protect the USB chip ports when the board is not energized and the MSA starts, the power to the 2N7002 pull-up resistors MUST COME from the USB board (3.3 or 5 volts are available). Although the USB chip operates from 3.3 volts, its ports may accept up to 5.5 (I prefer 3.3 myself).
> >
> > c) The SERCLK and CONVERT lines must be decoupled with 100pF capacitors at the ADC

board.
> >
> > I have prepared a 1.2x2.4 SLIM which includes the ADC and the video switch boards into one and incorporates all the changes described above. If there is any interest I'll do a small group buy. Just let me know.
> >
> > d) WIRING. Of course, all control wiring (boards PDM, ADC, PLO 1,2, 3, DDS 1, 3 and switches) has to be moved to the USB ports. I will post a wiring diagram in the files area although I believe that Scotty is going to do the same at his site. This sounds like a lot of work but gave the opportunity to clean up my snake's nest.
> >
> > 4. POWER SUPPLY
> > The conventional power supply at the control board may continue to be used. For sake of neatness I installed Sam W. power supply.
> >
> > I believe that's all
> >
> > Jim W1JGH
> >
>

8420. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-20 22:28:47 UTC
From: william sprowls
Topic: 8375 Message: 8420

Hi Dan and All,
No doubt, a microwave filter using FR4 is expected to change characteristics due to many factors. But let's evaluate the main goal of the 1st IF filter. It is maximum attenuation at the image frequency of 1034.7 MHz. We can rate that attenuation with my "taste scale":
worse than -70 dBc = sucks
-70 dBc to -80 dBc = edible
-80 dBc to -90 dBc = tasty
-90 dBc to -100 dBc = darn good
-100 dBc or better = "slap yo mamma" delicious (Jim, in Denver made one for the Verification MSA, and it measures -112 dBc)
Now, these vaues are only important during Spectrum Analyzer operation, not during VNA operation. For VNA operation, you may substitute the cavity filter with a wide band dog turd.
The bandwidth of the 1st IF filter (cavity filter) needs to be at least as wide as the widest Resolution Filter. Normally, the narrower the bandwidth of the cavity filter, the better the image frequency attenuation will be.

The present 4 banger, coaxial cavity filter does not change insertion loss, bandwidth, or its image attenuation with temperature or humidity. It does with vibration, but this is typical for mechanical filters. It does change its center frequency with temperature, and that is noticeable only during VNA operation. It shows up as a phase drift, about 1 degree of phase for every 1 degree of temperature change (F). However, due to other devices in the MSA/VNA the total phase variation in the Verification VNA is .42 degrees of phase for every 1 degree of temperature change (F). (The other devices move in the oposite direction). This is no big deal, since line calibrations compensate for MSA phase changes. Line calibrations are usually performed within 5 minutes of a test, and (usually) temperature changes very little in 5 minutes. There are several VNA users who go nuts when phase changes a few tenths of a degree (you know who you are). I don't get too
upset over a 1 or 2 degree phase change. Most of my home projects are not that critical for Phase.
Scotty

--- On Sat, 8/20/11, Dan Andersson <dan@...> wrote:

From: Dan Andersson <dan@...>
Subject: Re: [spectrumanalyzer] Re: BW of filters
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, August 20, 2011, 2:40 AM

Hiya Scotty,

Yes, I know what you mean :)

I do have access to some absurdly priced magic software and I get decent

results from it almost every time. And yes, some iterations is required every

time I do a filter design as the dielectrical constant varies from supplier to supplier and even batch to batch.

I don't even try to do cavity filters, even with the software help. I remember they used to burn these kindof engineers on a stake in Halem as witches and magicians once upon a time)

But the main problem is that if I design (with fiftyleven iterations) a working filter based on my FR4 stock (bought cheaply from Poland), I doubt anyone can use the masures right off and procude a filter on the exact frequency of 1013MHz.

It's all right to make the design and then immediately produce a batch with that material. Fine if you are in the filter manufacturing business.

I broke my last 1mm fine end mill a week ago so I'll first try to design a filter with the minimum measureof 1.5mm somewhere. If that is not possible, I'll order some new mill bit on Monday.

I have some windows of opportunity for garage work this weekend and the upcoming week for this.

With some luck, I can design a "good enough" filter design, who knows...

Scotty,

What data would your "ideal" filter have?

//Dan

On Saturday 20 August 2011 04:20:32 you wrote:

> Hi Dan,

> I had been in the "business" for many years before computers and software

> only big corporations could afford. I found that microwave filter

> engineers specialized in that one thing and very little else. The really

> good ones could not walk and chew gum at the same time. If their lives

> depended on reading the color code of a resistor I would have been to many

> funerals. Even the very best designers had a basket full of rejects before

> finalizing a design. Don't fret too much, they really are the dark side of

> engineering. Scotty

>

> --- On Fri, 8/19/11, Dan Andersson <dan@andersson.co.uk> wrote:

>

> From: Dan Andersson <dan@...>

> Subject: Re: [spectrumanalyzer] Re: BW of filters

> To: spectrumanalyzer@yahoogroups.com

> Date: Friday, August 19, 2011, 4:33 PM

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> On Sunday 14 August 2011 00:41:50 you wrote:

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> > Roderick.

8421. Re: [spectrumanalyzer] Re: USB update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-20 22:51:58 UTC
From: william sprowls
Topic: 6514 Message: 8421

Hi All,
 A few comments:
 Below Sam's post is one from Jim W1JGH. He stated:
a) THE MUN2211 buffers must be changed to 2N7002 FETs. Each one must have a 10K pull down resistor from gate to ground and a 4K7 pull up resistor. A 100pF cap MAY be needed from gate to ground.
  This is not an absolute "must", since the present (and future) software will compensate for the MUN2211's poor performance. However, I will make this change in the next revision of the SLIM-ADC module. You may modify your SLIM-ADC-12 or SLIM-ADC-16 if you wish. The 2N7002 fits perfectly on the pwb pads of the removed MUN2211.

Jim Hontoria and I have been evaluating the USB with our MSAs. We are each using a Cypress FX2 board that he purchased on E-bay. He is using USB to control the modules directly. I am using USB to control the SLIM Control Board. Both configurations are working better than I had expected. Dave has written Cypress firmware to take advantage of its embedded processing capability. This has resulted in a very speedy system. Quite comparable to using only the parallel LPT port.
 We are using software version116-4P, which is a "pre-Beta" version. This was to clear up a few problems with "talking" to the USB. It is basically the same as version116-4L.
  A full release of Version 116 is soon to happen, but we need to do a few more "fine tunes" of the USB area first. To those of you who only have USB on your computer this is really good news.
Scotty
--- On Sat, 8/20/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: USB update
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, August 20, 2011, 1:53 PM

The latest beta, which is beta version "F" but is titled MSA_version116-4L and is posted in the Files section, handles all configurations, except that we have an unreleased bug fix relating to the use of 4112-type PLLs when using USB to directly control the modules (i.e. no control board). We don't have separate versions of the software for different hardware configurations. I think we will soon be able to release the final software, which will revert to the name "spectrumanalyzer.bas" rather than the form MSA_version116-xx.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "radiotalk@..." <chris@...> wrote:

>

> Hi Jim

>

> Does 1. SOFTWARE version L only apply to USB configurations or Parallel ports as well with 4112 charge pumps?

>

> Chris

>

> --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:

> >

> > After a few intensive debugging sessions with the help of Scotty I got my the MSA working with 100% USB interface to my computer. 100% means that I don't use the control board at all. As far as I have been able to determine all functionality is there. The following summarizes what I have learnt and the changes that were required:

> >

> > 1. SOFTWARE. Version 116L does not require any changes to run USB with one exception: if you are using the 4112/4113 charge pumps in any of the PLO's, then a change must be made to the code. It will be incorporated into the next revision by Scotty.

> >

> > 2. USB INTERFACE: I use the EZUSB board with the 128 pin Cypress chip. It is available in eBay. Don't use a 56 pin chip or you will run out of ports. The drivers and instructions were posted to the group by Dave Roberts .

> >

> > 3. MSA HARDWARE MODIFICATIONS: The only changes have to do with the ADC board

> >

> > a) THE MUN2211 buffers must be changed to 2N7002 FETs. Each one must have a 10K pull down resistor from gate to ground and a 4K7 pull up resistor. A 100pF cap MAY be needed from gate to ground.

> >

> > b) In order to protect the USB chip ports when the board is not energized and the MSA starts, the power to the 2N7002 pull-up resistors MUST COME from the USB board (3.3 or 5 volts are available). Although the USB chip operates from 3.3 volts, its ports may accept up to 5.5 (I prefer 3.3 myself).

> >

> > c) The SERCLK and CONVERT lines must be decoupled with 100pF capacitors at the ADC board.

> >

> > I have prepared a 1.2x2.4 SLIM which includes the ADC and the video switch boards into one and incorporates all the changes described above. If there is any interest I'll do a

small group buy. Just let me know.

> >

> > d) WIRING. Of course, all control wiring (boards PDM, ADC, PLO 1,2, 3, DDS 1, 3 and switches) has to be moved to the USB ports. I will post a wiring diagram in the files area although I believe that Scotty is going to do the same at his site. This sounds like a lot of work but gave the opportunity to clean up my snake's nest.

> >

> > 4. POWER SUPPLY

> > The conventional power supply at the control board may continue to be used. For sake of neatness I installed Sam W. power supply.

> >

> > I believe that's all

> >

> > Jim W1JGH

> >

>

8422. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-20 22:55:27 UTC
From: Robert Fish
Topic: 8375 Message: 8422

Wide band dog turd,
How convenient, I have lots of those.

> Hi Dan and All,
> No doubt, a microwave filter using FR4 is expected to change
> characteristics due to many factors. But let's evaluate the main goal
> of the 1st IF filter. It is maximum attenuation at the image frequency
> of 1034.7 MHz. We can rate that attenuation with my "taste scale":
> worse than -70 dBc = sucks
> -70 dBc to -80 dBc = edible
> -80 dBc to -90 dBc = tasty
> -90 dBc to -100 dBc = darn good
> -100 dBc or better = "slap yo mamma" delicious (Jim, in Denver made
> one for the Verification MSA, and it measures -112 dBc)
> Now, these vaues are only important during Spectrum Analyzer
> operation, not during VNA operation. For VNA operation, you may
> substitute the cavity filter with a wide band dog turd.
> The bandwidth of the 1st IF filter (cavity filter) needs to be at
> least as wide as the widest Resolution Filter. Normally, the narrower
> the bandwidth of the cavity filter, the better the image frequency
> attenuation will be.
>
> The present 4 banger, coaxial cavity filter does not change
> insertion loss, bandwidth, or its image attenuation with temperature
> or humidity. It does with vibration, but this is typical for
> mechanical filters. It does change its center frequency with
> temperature, and that is noticeable only during VNA operation. It
> shows up as a phase drift, about 1 degree of phase for every 1 degree
> of temperature change (F). However, due to other devices in the
> MSA/VNA the total phase variation in the Verification VNA is .42
> degrees of phase for every 1 degree of temperature change (F). (The
> other devices move in the oposite direction). This is no big deal,
> since line calibrations compensate for MSA phase changes. Line
> calibrations are usually performed within 5 minutes of a test, and
> (usually) temperature changes very little in 5 minutes. There are
> several VNA users who go nuts when phase changes a few tenths of a
> degree (you know who you are). I don't get too upset over a 1 or 2
> degree phase change. Most of my home projects are not that critical
> for Phase.
> Scotty
>
> --- On *Sat, 8/20/11, Dan Andersson /<dan@...>/* wrote:
>
>
> From: Dan Andersson <dan@...>

> Subject: Re: [spectrumanalyzer] Re: BW of filters
> To: spectrumanalyzer@yahoogroups.com
> Date: Saturday, August 20, 2011, 2:40 AM
>
>
> Hiya Scotty,
>
> Yes, I know what you mean :)
>
> I do have access to some absurdly priced magic software and I get
> decent
> results from it almost every time. And yes, some iterations is
> required every
> time I do a filter design as the dielectrical constant varies from
> supplier to
> supplier and even batch to batch.
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> I don't even try to do cavity filters, even with the software
> help. I remember
> they used to burn these kindof engineers on a stake in Halem as
> witches and
> magicians once upon a time)
>
> But the main problem is that if I design (with fiftyleven
> iterations) a
> working filter based on my FR4 stock (bought cheaply from Poland
>), I doubt
> anyone can use the masures right off and procude a filter on the
> exact frequency
> of 1013MHz.
>
> It's all right to make the design and then immediately produce a
> batch with
> that material. Fine if you are in the filter manufacturing business.
>
> I broke my last 1mm fine end mill a week ago so I'll first try to
> design a filter
> with the minimum measureof 1.5mm somewhere. If that is not
> possible, I'll
> order some new mill bit on Monday.
>
> I have some windows of opportunity for garage work this weekend
> and the
> upcoming week for this.
>
> With some luck, I can design a "good enough" filter design, who
> knows...
>
> Scotty,
>

> What data would your "ideal" filter have?
>
> //Dan
>
> On Saturday 20 August 2011 04:20:32 you wrote:
> > Hi Dan,
> > I had been in the "business" for many years before computers and
> software
> > only big corporations could afford. I found that microwave filter
> > engineers specialized in that one thing and very little else.
> The really
> > good ones could not walk and chew gum at the same time. If their
> lives
> > depended on reading the color code of a resistor I would have
> been to many
> > funerals. Even the very best designers had a basket full of
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> > Date: Friday, August 19, 2011, 4:33 PM
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> > very few are usable for us normal ham's without a doctorate in
> maths.
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> > The 1.013GHz frequency is also a problem by being "too low" and that
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> > the size of some parts of the filters but makes other parts very
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> > I have a couple of hairpin solutions I will try this weekend.
> The problem
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> > to design the filrŕers larger than my smallest mill bits.
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> > There are also embarassingly little software help available for
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> > That said:
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> > There are difficulties due to FR4 laminates varying from 4.1 to
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> > Making the filter 5, 6 or fiftyleven pole makes no difference as
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> > They are very quick to mill.
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> > Amongst all othe delayed projecs - Sigh!
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> > On Sunday 14 August 2011 00:41:50 you wrote:
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> > > Roderick.
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8423. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-20 23:45:34 UTC
From: Dan Andersson
Topic: 8375 Message: 8423

Well,

The first two filters came out rather bad... Both on 934MHz centre which is a good thing as they have almost identical curves.

The filters are both Interdigital fillters with cct input
but they doesn't like 1.5mm FR4. I thnk I remember the 1.5mm as a problem I ran inte years ago but I don't remember what and why.

I'll mill the same recipe on 0.8mm FR4 tomorrow.

//Dan

On Saturday 20 August 2011 23:28:47 you wrote:
> Hi Dan and All,
> No doubt, a microwave filter using FR4 is expected to change
> characteristics due to many factors. But let's evaluate the main goal of
> the 1st IF filter. It is maximum attenuation at the image frequency of
> 1034.7 MHz. We can rate that attenuation with my "taste scale": worse than
> -70 dBc = sucks
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> > > Roderick.

8424. Re: [spectrumanalyzer] Re: USB update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-21 01:28:04 UTC
From: Jim Hontoria
Topic: 6514 Message: 8424

All recent versions (since September 2010) of the software are common to USB and Control Board. The hardware selections (USB, CB, 4112 and others) are made through setup.

Jim

On Sat, Aug 20, 2011 at 12:19 AM, radiotalk@xtra.co.nz <chris@...> wrote:

> **
>
>
> Hi Jim
>
> Does 1. SOFTWARE version L only apply to USB configurations or Parallel
> ports as well with 4112 charge pumps?
>
> Chris
>
>
> --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
> >
> > After a few intensive debugging sessions with the help of Scotty I got my
> the MSA working with 100% USB interface to my computer. 100% means that I
> don't use the control board at all. As far as I have been able to determine
> all functionality is there. The following summarizes what I have learnt and
> the changes that were required:
> >
> > 1. SOFTWARE. Version 116L does not require any changes to run USB with
> one exception: if you are using the 4112/4113 charge pumps in any of the
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> the next revision by Scotty.
> >
> > 2. USB INTERFACE: I use the EZUSB board with the 128 pin Cypress chip. It
> is available in eBay. Don't use a 56 pin chip or you will run out of ports.
> The drivers and instructions were posted to the group by Dave Roberts .
> >
> > 3. MSA HARDWARE MODIFICATIONS: The only changes have to do with the ADC
> board
> >
> > a) THE MUN2211 buffers must be changed to 2N7002 FETs. Each one must have
> a 10K pull down resistor from gate to ground and a 4K7 pull up resistor. A
> 100pF cap MAY be needed from gate to ground.
> >
> > b) In order to protect the USB chip ports when the board is not energized
> and the MSA starts, the power to the 2N7002 pull-up resistors MUST COME from

> the USB board (3.3 or 5 volts are available). Although the USB chip operates
> from 3.3 volts, its ports may accept up to 5.5 (I prefer 3.3 myself).
> >
> > c) The SERCLK and CONVERT lines must be decoupled with 100pF capacitors
> at the ADC board.
> >
> > I have prepared a 1.2x2.4 SLIM which includes the ADC and the video
> switch boards into one and incorporates all the changes described above. If
> there is any interest I'll do a small group buy. Just let me know.
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> > d) WIRING. Of course, all control wiring (boards PDM, ADC, PLO 1,2, 3,
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> wiring diagram in the files area although I believe that Scotty is going to
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> opportunity to clean up my snake's nest.
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> > 4. POWER SUPPLY
> > The conventional power supply at the control board may continue to be
> used. For sake of neatness I installed Sam W. power supply.
> >
> > I believe that's all
> >
> > Jim W1JGH
> >
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>

--
Jim G. Hontoria

8425. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-21 01:37:06 UTC
From: william sprowls
Topic: 8375 Message: 8425

Hi Dan,
 Let me make a suggestion. Create a Folder in our Photos section of the Yahoo Group. Take pics or plots of all of your trials and errors. Failures are always on the road to success. Someone might see a "trend" in your experiments and could offer some advice. I, for one, would like to see your results.
Scotty

--- On Sat, 8/20/11, Dan Andersson <dan@....uk> wrote:

From: Dan Andersson <dan@...>
Subject: Re: [spectrumanalyzer] Re: BW of filters
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, August 20, 2011, 6:45 PM

Well,

The first two filters came out rather bad... Both on 934MHz centre which is a

good thing as they have almost identical curves.

The filters are both Interdigital fillters with cct input

but they doesn't like 1.5mm FR4. I thnk I remember the 1.5mm as a problem I

ran inte years ago but I don't remember what and why.

I'll mill the same recipe on 0.8mm FR4 tomorrow.

//Dan

8426. Re: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-21 09:51:24 UTC
From: Dan Andersson
Topic: 8375 Message: 8426

I found out why 1.5mm is a bad idea.

Years ago, when I built the S53MV's SA design, he points out that to thick FR4 allows for to strong coupling between the microstrip resonators and subsequently not working as a filter. To much signal is coubled independently of the microstrip sizes.

So - 0.8mm it is.

-- Which introduces another problem, size.

The space between the microstrips are down to 0.6mm and I don'tr have any 0.5mm mill bits on the shelf.

I will look for workarounds but have to order some in worst case.
0.5mm mill bit will probably be very shortlived and I'm not to keen on it.

I usually takes snaps with my iPhone on the stuff I make. I'll see what's suitable to upload to the group.

Again, I don't search for perfection, just a "good enough" design to be useful based on Scotty's "whishes".

Cheers

Dan

On Sunday 21 August 2011 00:45:34 you wrote:
> Well,
>
> The first two filters came out rather bad... Both on 934MHz centre which is
> a good thing as they have almost identical curves.
>
> The filters are both Interdigital fillters with cct input
> but they doesn't like 1.5mm FR4. I thnk I remember the 1.5mm as a problem I
> ran inte years ago but I don't remember what and why.
>
> I'll mill the same recipe on 0.8mm FR4 tomorrow.
>
> //Dan
>

8427. AW: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-21 11:55:20 UTC
From: Weddig, Henning-Christof
Topic: 8427 Message: 8427

in genreal I do not believe that it will be possible to build a stripline filter on FR4 or even Rogers material having such a steep filter curve and low insertion loss!
The reason: the limited unloade quality factor of the material, ecthing tolerances etc.

73
Henning Weddig
DK5LV

Von: spectrumanalyzer@yahoogroups.com im Auftrag von Robert Fish
Gesendet: So 21.08.2011 00:55
An: spectrumanalyzer@...m
Betreff: Re: [spectrumanalyzer] Re: BW of filters

Wide band dog turd,
How convenient, I have lots of those.

Hi Dan and All,
No doubt, a microwave filter using FR4 is expected to change characteristics due to many factors. But let's evaluate the main goal of the 1st IF filter. It is maximum attenuation at the image frequency of 1034.7 MHz. We can rate that attenuation with my "taste scale":
worse than -70 dBc = sucks
-70 dBc to -80 dBc = edible
-80 dBc to -90 dBc = tasty
-90 dBc to -100 dBc = darn good
-100 dBc or better = "slap yo mamma" delicious (Jim, in Denver made one for the Verification MSA, and it measures -112 dBc)
Now, these vaues are only important during Spectrum Analyzer operation, not during VNA operation. For VNA operation, you may substitute the cavity filter with a wide band dog turd.
The bandwidth of the 1st IF filter (cavity filter) needs to be at least as wide as the widest Resolution Filter. Normally, the narrower the bandwidth of the cavity filter, the better the image frequency attenuation will be.

The present 4 banger, coaxial cavity filter does not change insertion loss, bandwidth, or its image attenuation with temperature or humidity. It does with vibration, but this is typical for mechanical filters. It does change its center frequency with temperature, and that is noticeable only during VNA operation. It shows up as a phase drift, about 1 degree of phase for every 1 degree of temperature change (F). However, due to other devices in the MSA/VNA the total phase variation in the Verification VNA is .42 degrees of phase for every 1 degree of temperature change (F). (The other devices move in the oposite direction). This is no big deal, since line calibrations compensate for MSA phase changes. Line calibrations are usually performed within 5 minutes of a test, and (usually) temperature changes very little in 5 minutes. There are several VNA users who go nuts when phase changes a few tenths of a degree (you know who you are). I don't get too upset over a 1 or 2 degree phase

change. Most of my home projects are not that critical for Phase.
Scotty

--- On Sat, 8/20/11, Dan Andersson <dan@...> <mailto:dan@...> wrote:

From: Dan Andersson <dan@...> <mailto:dan@...>
Subject: Re: [spectrumanalyzer] Re: BW of filters
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, August 20, 2011, 2:40 AM

Hiya Scotty,

Yes, I know what you mean :)

I do have access to some absurdly priced magic software and I get decent results from it almost every time. And yes, some iterations is required every time I do a filter design as the dielectrical constant varies from supplier to supplier and even batch to batch.

I don't even try to do cavity filters, even with the software help. I remember they used to burn these kindof engineers on a stake in Halem as witches and magicians once upon a time)

But the main problem is that if I design (with fiftyleven iterations) a working filter based on my FR4 stock (bought cheaply from Poland), I doubt anyone can use the masures right off and procude a filter on the exact frequency of 1013MHz.

It's all right to make the design and then immediately produce a batch with that material. Fine if you are in the filter manufacturing business.

I broke my last 1mm fine end mill a week ago so I'll first try to design a filter with the minimum measureof 1.5mm somewhere. If that is not possible, I'll order some new mill bit on Monday.

I have some windows of opportunity for garage work this weekend and the upcoming week for this.

With some luck, I can design a "good enough" filter design, who knows...

Scotty,

What data would your "ideal" filter have?

//Dan

On Saturday 20 August 2011 04:20:32 you wrote:
> Hi Dan,
> I had been in the "business" for many years before computers and software
> only big corporations could afford. I found that microwave filter
> engineers specialized in that one thing and very little else. The really
> good ones could not walk and chew gum at the same time. If their lives
> depended on reading the color code of a resistor I would have been to many
> funerals. Even the very best designers had a basket full of rejects before
> finalizing a design. Don't fret too much, they really are the dark side of

> engineering. Scotty
>
> --- On Fri, 8/19/11, Dan Andersson <dan@...> wrote:
>
> From: Dan Andersson <dan@...>
> Subject: Re: [spectrumanalyzer] Re: BW of filters
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, August 19, 2011, 4:33 PM
>
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>
> Back at the drawing board again.
>
>
>
> I have been browsing the available internet resources on PCB based filters
> but
>
> very few are usable for us normal ham's without a doctorate in maths.
>
>
>
> The 1.013GHz frequency is also a problem by being "too low" and that
> increases
>

> the size of some parts of the filters but makes other parts very tight due
> to
>
> the demand for low insertion loss and flatness.
>
>
>
> I have a couple of hairpin solutions I will try this weekend. The problem
> is
>
> to design the filrrers larger than my smallest mill bits.
>
>
>
> There are also embarassingly little software help available for actual
> filter
>
> design. The choice seems to be for expensive software or ridicouluosly
>
> expensive software.
>
>
>
> Luckily, I have access to one of these absurdly priced softwares and I get
>
> Gerber files as outputs. So I have a couple of alternatives to mill.
>
>
>
> That said:
>
>
>
> There are difficulties due to FR4 laminates varying from 4.1 to 4.7 so
> making
>
> more than one filter requires the material to be from the same batch.
>
>
>
> Using any of the PCB houses for PCB filters is not as easy as other PCB's.
> You
>
> need a couple of itetations and then it can change because of a different
> FR4
>
> batch or supplier.
>
>
>

> Making the filter 5, 6 or fiftyleven pole makes no difference as it's only
> the
>
> the size that changes. Another important factor is the encapsulation.
>
>
>
> They are very quick to mill.
>
>
>
> I'll try to design a small footprint filter so I can decide for go or nogo
>
> regarding PCB filters and the SA build.
>
>
>
> Amongst all othe delayed projecs - Sigh!
>
>
>
> //Dan
>
> On Sunday 14 August 2011 00:41:50 you wrote:
> > Don't know if this is useful but there is some information on PC board
> >
> > filters here:
> >
> >
> >
> > http://www.w6pql.com/pc_board_filters.htm
> >
> >
> >
> > Roderick.

8428. Re: AW: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-21 13:21:49 UTC
From: Dan Andersson
Topic: 8427 Message: 8428

Henning,

The quality factor of the material is not the show stopper.
Nor is the etching tolerances.

I can make stuff down to better than 0.0002" (averaging on 0.0001"), about 5 micron and averaging on 2.5 micron.

This is my "repeatability", not maximum accuracy. I can't measure below 1 micron at home :)

As rocket science is one of the simplest and developed and a well defined sciences (except if you work at NASA'a nightshift and mix imperials with metrics :) so this should not be suffering a total block.
But as microwave filter design is like rocket science, the building is not...

I'm rather certain we can build ONE working filter - but maybe not two or three.

As you point out, the tolerances are small with the narrow bandwidth required for the filter.

Even if I can produce a couple of good enough filters, I doubt anyone else can take the desig data and produce a working copy without going through the tuning iterations again. Also, I bought my FR4 from a Polish supplier. Who knows who produced it and I don't know the dielectrical constand. I required, I can of course measure it but...

The cavity filter and it's derivatives are without discussion the best solution. However, good ones are difficult to come by and diy is a bit twitch with a good amount of magic required.

I'm only trying to find out if I can make a "good enough" PCB based microstrip filter.

//Dan

On Sunday 21 August 2011 12:55:20 you wrote:
> in genreal I do not believe that it will be possible to build a stripline
> filter on FR4 or even Rogers material having such a steep filter curve and
> low insertion loss! The reason: the limited unloade quality factor of the
> material, ecthing tolerances etc.
>
> 73
> Henning Weddig
> DK5LV
>
>

> _____
>

8429. Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-21 19:50:54 UTC
From: DanielS
Topic: 8375 Message: 8429

There was an excellent article on computer aided interdigital bandpass filter design in the January 1985 issue of Ham Radio. You can read it online at www.qsl.net/n9zia/spec/idbpf.pdf

The program has been ported to a web server at http://www.wa4dsy.net/cgi-bin/idbpf

A useful explanation and the original Basic code can be found at http://www.wa4dsy.net/idbpfdraw.html

I used the program to build two filters for the 1296 MHz ham band using a milling machine. Both filters tuned up perfectly on a spectrum analyzer in a few minutes and worked perfectly the first time. If you don't have a milling machine you should be able to build one by soldering copper clad pc material to the same dimensions. There was no black art or witchcraft involved.

Dan Schultz N8FGV

>I had been in the "business" for many years before
>computers and software only big corporations could
>afford. I found that microwave filter engineers
>specialized in that one thing and very little else.
>The really good ones could not walk and chew gum at
>the same time. If their lives depended on reading
>the color code of a resistor I would have been to
>many funerals. Even the very best designers had a
>basket full of rejects before finalizing a design.
>Don't fret too much, they really are the dark side
>of engineering.

8430. Re: [spectrumanalyzer] BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-21 22:55:34 UTC
From: William Dillon
Topic: 8375 Message: 8430

Not for nothing, but I had always been very intimidated by the cavity filters. Because I'm still dealing with digital signaling nastiness (the reason for building a USB control board), I hadn't been able to test my filters. I borrowed a cheepie spectrum analyzer with tracking generator from work (and believe me, it's not very good), and found that they both work! I was able to tune them to 1013.4 Mhz with 2 Mhz BW (-3dB points). I think that I have at least 86dB of isolation.

I'm not totally confident in my measurement techniques, especially considering this analyzer doesn't have any measurement tools built-in. It only has a center frequency display and a marker. It also has a poor noise floor.

Measure the insertion loss:

The top line measurement from the tracking generator is at +1dBm with 20dB is attenuation on the input -> -19dBm w/o the filter installed. With the filter installed it drops down 6dB from the top line. Therefore the insertion loss is 6dB.

Measure the isolation

Starting with the same settings as before (-19dBm out of the TG) and the peak of the filter center at 6dB below the top, the noise floor is 66dB down from the peak. I can turn off 20dB of attenuation and the noise floor doesn't move. I think this means that I have _at least_ 86dB of isolation.

The bandwidth measurement seems trivial.

Anyway, I'm happy that building the cavity filter wasn't NEARLY as hard as I thought it would be. And, I'm pleased that I have a filter that is (at least) somewhere between "tasty" and "edible"!

- Will

On Aug 21, 2011, at 12:50 PM, DanielS wrote:

> There was an excellent article on computer aided interdigital bandpass filter design in the January 1985 issue of Ham Radio. You can read it online at www.qsl.net/n9zia/spec/idbpf.pdf
>
> The program has been ported to a web server at http://www.wa4dsy.net/cgi-bin/idbpf
>
> A useful explanation and the original Basic code can be found at http://www.wa4dsy.net/idbpfdraw.html
>
> I used the program to build two filters for the 1296 MHz ham band using a milling machine. Both filters tuned up perfectly on a spectrum analyzer in a few minutes and worked perfectly the first time. If you don't have a milling machine you should be able to build one by soldering copper clad pc material to the same dimensions. There was no black art or

witchcraft involved.
>
> Dan Schultz N8FGV
>
> ----------
>
> >I had been in the "business" for many years before
> >computers and software only big corporations could
> >afford. I found that microwave filter engineers
> >specialized in that one thing and very little else.
> >The really good ones could not walk and chew gum at
> >the same time. If their lives depended on reading
> >the color code of a resistor I would have been to
> >many funerals. Even the very best designers had a
> >basket full of rejects before finalizing a design.
> >Don't fret too much, they really are the dark side
> >of engineering.
>
>

8431. Re: AW: [spectrumanalyzer] Re: BW of filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-22 23:23:08 UTC
From: Dan Andersson
Topic: 8427 Message: 8431

Ha!

I have a batch of 0.1 mm 2 flute end mills arroving tomorrow Tuesday.

That should allow me to mill some more narrow filter designs on 0.8mm FR4.

We'll see.

//Dan

8432. New file uploaded to spectrumanalyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-23 14:23:09 UTC
From: spectrumanalyzer@yahoogroups.com
Topic: 111 Message: 8432

Hello,

This email message is a notification to let you know that
a file has been uploaded to the Files area of the spectrumanalyzer
group.

File : /M0DFI SA Filter Testing/snap-unknown-20110823-151719-1.jpeg
Uploaded by : m0dfi <dan@...>
Description : 1mm and 0.1mm mill bits

You can access this file at the URL:
http://groups.yahoo.com/group/spectrumanalyzer/files/M0DFI%20SA%20Filter%20Testing/snap-unknown-20110823-151719-1.jpeg

To learn more about file sharing for your group, please visit:
http://help.yahoo.com/l/us/yahoo/groups/original/members/web/index.html
Regards,

m0dfi <dan@...>

8433. BW

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-23 14:27:13 UTC
From: m0dfi
Topic: 8433 Message: 8433

So,

Got my new mill bit.

I will now be able to mill with 0.1mm cut and +/- 0.001" repeatability.

(Sorry for the mixed units...)

I wonder how long before I break that 0.1mm mill bit!

Anyone else with ideas and drawing of a PCB based filter.

I can take Gerber, Gcode and possibly DXF and some bitmaps as well.

//Dan

8434. Setting Magnitude Scale

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-25 21:53:53 UTC
From: Eric Nystrom
Topic: 8434 Message: 8434

I am going through the test procedure for the Log Detector. In step 7 it says to change the lower limit of the magnitude scale to -120dB. I have searched every menu and have not found a way to change the magnitude scale. I know it must be obvious. Help please.
Eric Nystrom

8435. Re: [spectrumanalyzer] Setting Magnitude Scale

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-25 22:25:42 UTC
From: Geoff Moore
Topic: 8434 Message: 8435

Double left click anywhere in the vinicity of the Y axis you want to change to bring up a window where you can select the top and bottom reference, number of divisions and a few other parameters. Can't remember where I found the info, it was a long time ago.

Geoff

----- Original Message -----
From: "Eric Nystrom" <gloimon@...>
To: <spectrumanalyzer@yahoogroups.com>
Sent: Thursday, August 25, 2011 10:53 PM
Subject: [spectrumanalyzer] Setting Magnitude Scale

>I am going through the test procedure for the Log Detector. In step 7 it
>says
> to change the lower limit of the magnitude scale to -120dB. I have
> searched
> every menu and have not found a way to change the magnitude scale. I know
> it must be obvious. Help please.
> Eric Nystrom
>

8436. Re: [spectrumanalyzer] Setting Magnitude Scale

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-25 22:29:44 UTC
From: Eric Nystrom
Topic: 8434 Message: 8436

Geoff,

Thanks. That is what I needed.

Eric Nystrom

From: Geoff Moore <m0ore@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Thursday, August 25, 2011 6:25 PM
Subject: Re: [spectrumanalyzer] Setting Magnitude Scale

Double left click anywhere in the vinicity of the Y axis you want to change
to bring up a window where you can select the top and bottom reference,
number of divisions and a few other parameters. Can't remember where I found
the info, it was a long time ago.

Geoff

----- Original Message -----
From: "Eric Nystrom" <gloimon@...>
To: <spectrumanalyzer@yahoogroups.com>
Sent: Thursday, August 25, 2011 10:53 PM
Subject: [spectrumanalyzer] Setting Magnitude Scale

>I am going through the test procedure for the Log Detector. In step 7 it
>says
> to change the lower limit of the magnitude scale to -120dB. I have
> searched
> every menu and have not found a way to change the magnitude scale. I know
> it must be obvious. Help please.
> Eric Nystrom
>

8437. Band switch hardware

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-25 22:56:40 UTC
From: jghbeta
Topic: 8437 Message: 8437

I seem to recall there was a design for a band switching circuit, selecting the diplexer output through softwsre control. Is there such a thing or is it wishfull thing from my part?

Jim

8438. Avcom PSA 65c Spectrum analyzer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-26 00:15:58 UTC
From: darylynn d
Topic: 8438 Message: 8438

Sorry for the of topic post, But I really am having a hard time finding service litt for this machine.
Thank you all for allowing this post.
Daryl kb5zxm Magnolia Texas

8439. Re: [spectrumanalyzer] Setting Magnitude Scale

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-26 02:18:50 UTC
From: Jim Hontoria
Topic: 8434 Message: 8439

Just right click on the right edge of the display (probably you have it at 0-100 dBm). It will open a window where you can set the magnitude scale to your hearts content.

Jim

On Thu, Aug 25, 2011 at 5:53 PM, Eric Nystrom <gloimon@...> wrote:

> **
>
>
> I am going through the test procedure for the Log Detector. In step 7 it
> says
> to change the lower limit of the magnitude scale to -120dB. I have
> searched
> every menu and have not found a way to change the magnitude scale. I know
> it must be obvious. Help please.
>
> Eric Nystrom
>
>
>

--
Jim G. Hontoria

8440. Re: Band switch hardware

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-26 13:29:59 UTC
From: Sam
Topic: 8437 Message: 8440

Jim,
I was working on one, but got diverted. I think the best approach is to use an HF3-06 relay (12V, non-latching) (Mouser) and drive it via a buffer (maybe just a transistor) from the Band control bit. (Be sure to put a protection diode across the coil.) This relay operates fine off 10V and draws only about 10 ma so there is no need to mess with latching circuitry. Its isolation at 10 MHz is on the order of 100 dB.

If the diplexer contains attenuation in the 10.7 MHz (2G) output that approximately equals the losses that would occur in the cavity filter and Mixer 2, 100 dB of isolation in the band switch should be plenty.

I also have a board that I designed as a transmission/reflection switch, using 3 PE421's, which design could also be used for the band switch, though its isolation would be complete overkill at 10.7 MHz. It's been sitting next to my MSA for 2 months waiting for me to build it.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> I seem to recall there was a design for a band switching circuit, selecting the diplexer output through softwsre control. Is there such a thing or is it wishfull thing from my part?
>
> Jim
>

8441. Re: [spectrumanalyzer] Re: Band switch hardware

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-26 18:55:49 UTC
From: Jim Hontoria
Topic: 8437 Message: 8441
Attachments: 1 described; binary payloads are missing from this source WARC

What do you think of the ADG918?. I came out with the attached design

Jim

On Fri, Aug 26, 2011 at 9:29 AM, Sam <swetterlin@...> wrote:

> **
>
>
> Jim,
> I was working on one, but got diverted. I think the best approach is to use
> an HF3-06 relay (12V, non-latching) (Mouser) and drive it via a buffer
> (maybe just a transistor) from the Band control bit. (Be sure to put a
> protection diode across the coil.) This relay operates fine off 10V and
> draws only about 10 ma so there is no need to mess with latching circuitry.
> Its isolation at 10 MHz is on the order of 100 dB.
>
> If the diplexer contains attenuation in the 10.7 MHz (2G) output that
> approximately equals the losses that would occur in the cavity filter and
> Mixer 2, 100 dB of isolation in the band switch should be plenty.
>
> I also have a board that I designed as a transmission/reflection switch,
> using 3 PE421's, which design could also be used for the band switch, though
> its isolation would be complete overkill at 10.7 MHz. It's been sitting next
> to my MSA for 2 months waiting for me to build it.
>
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
> >
> > I seem to recall there was a design for a band switching circuit,
> selecting the diplexer output through softwsre control. Is there such a
> thing or is it wishfull thing from my part?
> >
> > Jim
> >
>
>
>

--
Jim G. Hontoria

8442. DDS Testing

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-26 19:08:27 UTC
From: Eric Nystrom
Topic: 8442 Message: 8442

I am on step 13 in the DDS testing where the procedure calls for sweeping the DDS output filter. I have set everything according to the procedure, but the frequency of the DDS stays fixed at 10.7 MHz. I am using the download from the files section entitled version 116_4L. I have run both the .exe version and the .bas version. I have the

variables displayed and I can see the DDS1 output frequency sweeping in the variables. I have attached a logic analyzer to the three control lines for the DDS and they are updated
periodically, but the serial data stream does not change.

Am I missing something obvious?

Eric Nystrom

8443. Re: [spectrumanalyzer] DDS Testing

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-26 22:43:44 UTC
From: william sprowls
Topic: 8442 Message: 8443

Hi Eric,
 First, I have verified this test is still working fine with the Verification MSA using the software version 116-4L.
 This is testing DDS 1 so make sure you don't get DDS 3 confused. You should be getting a screen response that looks like a pulse. Its width depends on the response of the DDS 1 crystal filter. Using the specified filter, it should be about 20 KHz wide.
 What is your indication that the frequency output of DDS 1 is not changing and stays at 10.7 KHz?
  Go ahead and do step 14. This verifies that the DDS1 is commanding properly, and outputting the correct frequency. In this case it is 1 cycle every 10 seconds.
Scotty

--- On Fri, 8/26/11, Eric Nystrom <gloimon@...> wrote:

From: Eric Nystrom <gloimon@...>
Subject: [spectrumanalyzer] DDS Testing
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Friday, August 26, 2011, 2:08 PM

I am on step 13 in the DDS testing where the procedure calls for sweeping the DDSoutput filter. I have set everything according to the procedure, but the frequency of theDDS stays fixed at 10.7 MHz. I am using the download from the files section entitledversion 116_4L. I have run both the .exe version and the .bas version. I have the variables displayed and I can see the DDS1 output frequency sweeping in the variables.I have attached a logic analyzer to the three control lines for the DDS and they are updatedperiodically, but the serial data stream does not change.
Am I missing something
obvious?
 Eric Nystrom

8444. Re: Band switch hardware

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-26 23:00:41 UTC
From: Sam
Topic: 8437 Message: 8444

Putting the switch on the diplexer board, as you have done, is a good idea. The ADG918 might be worth a try. I can't figure out its data sheet. it shows S21 off-isolation in the low 80's but S12 off-isolation in the 60's. I can't see how they can be significantly different. 80's might work, but 60's is weak.

You could use exactly the same approach with the PE4251. It would give you 85 dB of isolation. At that level, the major vulnerability would be having a strong 10.7 MHz signal in the input, that could leak directly through Mixer 1 and the switch when in 1G mode, and would show up at all frequencies like an increase in the noise floor. That's purely an SA issue, and probably not a big problem.

You also have a direct Vdd connection, for which you probably need to reduce the voltage. A voltage divider with a bypass cap would work.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> What do you think of the ADG918?. I came out with the attached design
>
> Jim
>
> On Fri, Aug 26, 2011 at 9:29 AM, Sam <swetterlin@...> wrote:
>
> > **
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> >
> > Jim,
> > I was working on one, but got diverted. I think the best approach is to use
> > an HF3-06 relay (12V, non-latching) (Mouser) and drive it via a buffer
> > (maybe just a transistor) from the Band control bit. (Be sure to put a
> > protection diode across the coil.) This relay operates fine off 10V and
> > draws only about 10 ma so there is no need to mess with latching circuitry.
> > Its isolation at 10 MHz is on the order of 100 dB.
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> > If the diplexer contains attenuation in the 10.7 MHz (2G) output that
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> > Mixer 2, 100 dB of isolation in the band switch should be plenty.
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> > I also have a board that I designed as a transmission/reflection switch,
> > using 3 PE421's, which design could also be used for the band switch, though
> > its isolation would be complete overkill at 10.7 MHz. It's been sitting next
> > to my MSA for 2 months waiting for me to build it.
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> > --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
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> > > I seem to recall there was a design for a band switching circuit,
> > selecting the diplexer output through softwsre control. Is there such a
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> > > Jim
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> --
> Jim G. Hontoria
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8445. Re: [spectrumanalyzer] Re: Band switch hardware

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-27 20:19:24 UTC
From: Jim Hontoria
Topic: 8437 Message: 8445

The problem I see with the Peregrine switch is that below 10 MHz the linearity is poor and I don't know if the calibration will take care of that. It is specified from 10MHz up, so the very low frequencies are toast.

I am also looking at the MiniCircuits HSA2-30DR that has very nice curves but the isolation may be too low.

I have prepared layouts for all threee alternatives, including pads for a voltage divider and decoupling cap.

Jim

On Fri, Aug 26, 2011 at 7:00 PM, Sam <swetterlin@...> wrote:

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>
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> Putting the switch on the diplexer board, as you have done, is a good idea.
> The ADG918 might be worth a try. I can't figure out its data sheet. it shows
> S21 off-isolation in the low 80's but S12 off-isolation in the 60's. I can't
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> 85 dB of isolation. At that level, the major vulnerability would be having a
> strong 10.7 MHz signal in the input, that could leak directly through Mixer
> 1 and the switch when in 1G mode, and would show up at all frequencies like
> an increase in the noise floor. That's purely an SA issue, and probably not
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> You also have a direct Vdd connection, for which you probably need to
> reduce the voltage. A voltage divider with a bypass cap would work.
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> Sam W.
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> > > protection diode across the coil.) This relay operates fine off 10V and
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> > > Its isolation at 10 MHz is on the order of 100 dB.
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> > > to my MSA for 2 months waiting for me to build it.
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> > > Sam W.
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> > > --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
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> > --
> > Jim G. Hontoria
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Jim G. Hontoria

8446. Re: Band switch hardware

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-27 23:30:25 UTC
From: inlinebeginner
Topic: 8437 Message: 8446

PE4251 looks ok, I have been using it for this purpose for while, and I did not see any problem.
Lin

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> The problem I see with the Peregrine switch is that below 10 MHz the
> linearity is poor and I don't know if the calibration will take care of
> that. It is specified from 10MHz up, so the very low frequencies are toast.
>
> I am also looking at the MiniCircuits HSA2-30DR that has very nice curves
> but the isolation may be too low.
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> I have prepared layouts for all threee alternatives, including pads for a
> voltage divider and decoupling cap.
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> Jim
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> On Fri, Aug 26, 2011 at 7:00 PM, Sam <swetterlin@...> wrote:
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> > reduce the voltage. A voltage divider with a bypass cap would work.
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> > --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@>
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> > > Jim G. Hontoria
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> Jim G. Hontoria
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8447. Re: Band switch hardware

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-28 22:40:20 UTC
From: Sam
Topic: 8437 Message: 8447

I did some investigation into the issue of non-linearity below 10 MHz. It is only relevant at fairly high powers, as it has to do with an internal diode becoming conductive at higher powers. Below 0 dBm it is a complete non-issue. It kicks in above that at some level that depends on frequency.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> The problem I see with the Peregrine switch is that below 10 MHz the
> linearity is poor and I don't know if the calibration will take care of
> that. It is specified from 10MHz up, so the very low frequencies are toast.
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> I am also looking at the MiniCircuits HSA2-30DR that has very nice curves
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> voltage divider and decoupling cap.
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8448. The 0.1% resistors for shunt and serial fixture

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-29 16:38:50 UTC
From: inlinebeginner
Topic: 8448 Message: 8448

Sam
The 0.1% 62 ohm resisotr in the shunt fixture circuit (VNA guide) might be 61.9 ohm 0.1%, is that right?
I could not find the 127ohm 0.1% for the serial fixture, Digikey is 0 QTY available. Where did you buy this resistor?
Did anyone publish a verification data for the RLC model measurement? I tested a 100pF cap, with fiture made of 1% resistor, and got the following result:
Fs=263.2375 MHz; R=15.34 ohms; L=4.349 nH; C=84.04 pF; Qu=0.469; QL=0.288
I measured same cap with Smith chart on HP8753E, I got 100.1pF, differenct from 84.04pF.
Maybe the 1% resistor is not good enough?
Thanks
Lin

8449. Re: The 0.1% resistors for shunt and serial fixture

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-29 20:08:14 UTC
From: Sam
Topic: 8448 Message: 8449

Lin,
Mouser is generally a better source for precision resistors, and has the 62 and 127 ohm 0.1% resistors. But 61.9 should work fine in place of 62.

I did a lot of testing with RLC analysis and it performed very well. However, RLC analysis in Transmission mode, which I suspect you were using, uses just simple Thru calibration and is not as accurate as RLC in Reflection mode in these circumstances:

1. Higher frequencies. With such simple calibration, the shunt fixture loses accuracy above 100 MHz, and even below that it may be necessary to specify the "delay", which is the one-way time delay from the point where the fixture attenuators connect to the end of the connector to which the DUT connects. You can make a decent estimate of that time delay based on the connector length. If you are measuring components on the back of an SMA connector that is attached to the SMA connector of the fixture, the delay should include both connectors.

2. If your TG output or MSA input are far from 50 ohms, the internal attenuation of the shunt fixture may not be high enough for extreme accuracy, and you need to add attenuation either externally or by building a shunt fixture with higher internal attenuation.

In reflection mode, OSL calibration corrects for all these errors, and also corrects for errors in the fixture resistors. Transmission mode RLC is really intended for relatively low frequency use where the above issues are normally minor. Your measurements are made near 263 MHz, where it is probably necessary to use Reflection mode. I'm guessing you used Transmission mode.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
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> I could not find the 127ohm 0.1% for the serial fixture, Digikey is 0 QTY available. Where did you buy this resistor?
> Did anyone publish a verification data for the RLC model measurement? I tested a 100pF cap, with fiture made of 1% resistor, and got the following result:
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> I measured same cap with Smith chart on HP8753E, I got 100.1pF, differenct from 84.04pF. Maybe the 1% resistor is not good enough?
> Thanks
> Lin
>

8450. Re: The 0.1% resistors for shunt and serial fixture

Yahoo group: spectrumanalyzer (2011)
Date: 2011-08-30 15:00:25 UTC
From: inlinebeginner
Topic: 8448 Message: 8450

Sam
Thanks for the information. For the 127 ohm 0.1%, looks like I have to wait for the lead time, even order from mouser.com. I found a 0.05% LCR bridge and screened some 1% resistor with this bridge. The two resistor I screened should be a little bit better than 0.1%.
Yes, I tried to meausre some cap, 1p, 10p, 100p to put into the simulation, the transmission mode may not reach that high frequency.
I tried reflection mode with a 1GHz DC, the phase jump from -180 to 180 degree is very noisy, SRF around 590MHz. The temperature drift made might be a problem during the test. I can try more later and publish the screenshot.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Lin,
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84.04pF. Maybe the 1% resistor is not good enough?
> > Thanks
> > Lin
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>

8451. Brass Sheet Thickness

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-05 05:47:23 UTC
From: VINCENTC
Topic: 8451 Message: 8451

Hi,

I am early on in the project. I just received my panel of boards and I am beginning construction of the Control Board. I plan on constructing my enclosure using Brass panels. What thickness/gauge is preferable? Also what size angle brackets for re-enforcement?
Thanks
Vince

8452. A full kit is available on eBay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-05 06:19:07 UTC
From: taishan_ma
Topic: 8452 Message: 8452

Maybe someone need them.

http://www.ebay.com/itm/my-version-scottys-SA-/220845918901?pt=LH_DefaultDomain_0&hash=item336b714ab5#ht_1456wt_1395

Thanks.
Taishan

8453. Re: [spectrumanalyzer] Brass Sheet Thickness

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-05 14:58:12 UTC
From: william sprowls
Topic: 8451 Message: 8453

Hi Vince,
Good question. I used double sided .062 FR4 as panel enclosure. Very sturdy and easy to solder to.
 If you want to use brass, I would suggest anything between .031 (1/32) and .062 (1/16). Thick is fine, but difficult to solder. For either, you don't need much bracing. Your angle brackets will perform as bracing (3/4 inch triangles). Use one on each corner, on the top and on the bottom (8). They provide a place to screw down covers (top and bottom), and rubber feet (bottom). My bottom cover is held in place only when the threaded (6-32) rubber feet are installed. Your style of "egg carton" to hold the modules will also perform as bracing.
Scotty

--- On Mon, 9/5/11, VINCENTC <n1vc@...> wrote:

From: VINCENTC <n1vc@yahoo.com>
Subject: [spectrumanalyzer] Brass Sheet Thickness
To: spectrumanalyzer@yahoogroups.com
Date: Monday, September 5, 2011, 12:47 AM

Hi,

I am early on in the project. I just received my panel of boards and I am beginning construction of the Control Board. I plan on constructing my enclosure using Brass panels. What thickness/gauge is preferable? Also what size angle brackets for re-enforcement?

Thanks

Vince

8454. Re: Brass Sheet Thickness

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-06 00:02:06 UTC
From: Sam
Topic: 8451 Message: 8454

I used 0.032" brass for the sides. Each was a 4"x10" panel because I could buy that size and didn't have to do any cutting, though I think 5" x 12" would be ideal. I used brass angle much as Scotty describes, except I did not put angle around the top of the sides, but rather put it on the sides of the top cover (top and bottom covers were made of 0.062" FR4), so it wouldn't be in the way when I took the cover off. I also ended up putting a reinforcing bar of tiny brass angle from front to back at center top, and ended up hanging my support grid from it.

For brass angle, you have a choice of relatively thin material with wide sides, or thicker material with narrower sides; I went with the latter.

At Home Depot I found clamps designed to hold wood or sheet metal at right angles, and it worked great. I could clamp two sides together, and there was room to slide the brass angle on the corner and solder it. It was the first box I ever made that was actually square.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Vince,
> Good question. I used double sided .062 FR4 as panel enclosure. Very sturdy and easy to solder to.
> Â If you want to use brass, I would suggest anything between .031 (1/32) and .062 (1/16). Thick is fine, but difficult to solder. For either, you don't need much bracing. Your angle brackets will perform as bracing (3/4 inch triangles). Use one on each corner, on the top and on the bottom (8). They provide a place to screw down covers (top and bottom), and rubber feet (bottom). My bottom cover is held in place only when the threaded (6-32) rubber feet are installed. Your style of "egg carton" to hold the modules will also perform as bracing.
> Scotty
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> --- On Mon, 9/5/11, VINCENTC <n1vc@...> wrote:
>
> From: VINCENTC <n1vc@...>
> Subject: [spectrumanalyzer] Brass Sheet Thickness
> To: spectrumanalyzer@yahoogroups.com
> Date: Monday, September 5, 2011, 12:47 AM
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>
> Thanks
>
> Vince
>

8455. Re: Brass Sheet Thickness

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-06 14:21:20 UTC
From: nealmartini
Topic: 8451 Message: 8455

Hi Vince,

For what it's worth, I thought I would point out that I made my MSA enclosure out of a combination of wood and brass. No soldering. See

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/995283679/pic/159422940/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

If the integrity of the individual module sealing is maintained, I don't believe that it is necessary to have a totally enclosed metal box. The noise/spur levels I obtained appear very consistent with what others have gotten.

Good luck with your project.

Neal

--- In spectrumanalyzer@yahoogroups.com, "VINCENTC" <n1vc@...> wrote:
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> Hi,
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> I am early on in the project. I just received my panel of boards and I am beginning construction of the Control Board. I plan on constructing my enclosure using Brass panels. What thickness/gauge is preferable? Also what size angle brackets for re-enforcement?
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> Vince
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8456. Re: Brass Sheet Thickness

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-06 17:21:54 UTC
From: VINCENTC
Topic: 8451 Message: 8456

Neal,
It looks great. Is that Plywood? The only drawback is my woodworking skills are not too great. I do have a 9" bandsaw that I am using to cut out the circuit boards from the panel. What kind of wood working tools did you use for your cabinet?
Vince

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> Hi Vince,
>
> For what it's worth, I thought I would point out that I made my MSA enclosure out of a combination of wood and brass. No soldering. See
>
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/995283679/pic/159422940/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc
>
> If the integrity of the individual module sealing is maintained, I don't believe that it is necessary to have a totally enclosed metal box. The noise/spur levels I obtained appear very consistent with what others have gotten.
>
> Good luck with your project.
>
> Neal
>
>
>
> --- In spectrumanalyzer@yahoogroups.com, "VINCENTC" <n1vc@> wrote:
> >
> > Hi,
> >
> > I am early on in the project. I just received my panel of boards and I am beginning construction of the Control Board. I plan on constructing my enclosure using Brass panels. What thickness/gauge is preferable? Also what size angle brackets for re-enforcement?
> > Thanks
> > Vince
> >
>

8457. Relay for Transmisson Reflection Bridge

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-06 21:48:01 UTC
From: Eric Nystrom
Topic: 8451 Message: 8457

I am looking for parts for the Transmission Reflection Bridge and a HF3 56 Relay is specified. They don't appear to be available anywhere that I can find.

Would the HF3 06 which is a 75 ohm relay work? I noticed that one was mentioned in a recent discussion for use with the band switching hardware.

Eric Nystrom

8458. Re: [spectrumanalyzer] Relay for Transmisson Reflection Bridge

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-06 23:20:19 UTC
From: Jim Hontoria
Topic: 8451 Message: 8458

The AXICOM HF393 should do it for the bridge.

Jim H

On Tue, Sep 6, 2011 at 5:48 PM, Eric Nystrom <gloimon@...> wrote:

> **
>
>
> I am looking for parts for the Transmission Reflection Bridge and a
> HF3 56 Relay is specified. They don't appear to be available anywhere
> that I can find.
>
> Would the HF3 06 which is a 75 ohm relay work? I noticed that one was
> mentioned
> in a recent discussion for use with the band switching hardware.
>
> Eric Nystrom
>
>
>

--
Jim G. Hontoria

8459. Re: Brass Sheet Thickness

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-06 23:25:04 UTC
From: VINCENTC
Topic: 8451 Message: 8459

Sam,
I was thinking about the "making it square" problem too and how I would hold the plates together while soldering. Do you have a Home Depot skew number for those clamps or a jpeg even? Sometimes asking the store help doesn't always produce what you are looking for. If not I will try to describe it to them as best as I can and see what they produce.
Also this site claims they will do custom cuts. I think I will go with .032".
<http://www.onlinemetals.com/merchant.cfm?pid=1591&step=4&showunits=inches&id=1116&top_cat=79>

Thanks much
Vince

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I used 0.032" brass for the sides. Each was a 4"x10" panel because I could buy that size and didn't have to do any cutting, though I think 5" x 12" would be ideal. I used brass angle much as Scotty describes, except I did not put angle around the top of the sides, but rather put it on the sides of the top cover (top and bottom covers were made of 0.062" FR4), so it wouldn't be in the way when I took the cover off. I also ended up putting a reinforcing bar of tiny brass angle from front to back at center top, and ended up hanging my support grid from it.
>
> For brass angle, you have a choice of relatively thin material with wide sides, or thicker material with narrower sides; I went with the latter.
>
> At Home Depot I found clamps designed to hold wood or sheet metal at right angles, and it worked great. I could clamp two sides together, and there was room to slide the brass angle on the corner and solder it. It was the first box I ever made that was actually square.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> >
> > Hi Vince,
> > Good question. I used double sided .062 FR4 as panel enclosure. Very sturdy and easy to solder to.
> > Â If you want to use brass, I would suggest anything between .031 (1/32) and .062 (1/16). Thick is fine, but difficult to solder. For either, you don't need much bracing. Your angle brackets will perform as bracing (3/4 inch triangles). Use one on each corner, on the top and on the bottom (8). They provide a place to screw down covers (top and bottom), and rubber feet (bottom). My bottom cover is held in place only when the threaded (6-32) rubber feet are installed. Your style of "egg carton" to hold the modules will also perform as bracing.
> > Scotty
> >

> > --- On Mon, 9/5/11, VINCENTC <n1vc@> wrote:
> >
> > From: VINCENTC <n1vc@>
> > Subject: [spectrumanalyzer] Brass Sheet Thickness
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Monday, September 5, 2011, 12:47 AM
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> > Hi,
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> >
> > Thanks
> >
> > Vince
> >
>

8460. Re: [spectrumanalyzer] Re: Brass Sheet Thickness

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-06 23:48:35 UTC
From: Dan Andersson
Topic: 8451 Message: 8460

Making it square?

The simplest way is to make a square bit of wood as a template. If you have 3 different size of enclosures to make - then make three wooden templates.

I built a couple of S53MV spectrum analyzers this way. The boxes looks like being fabricated in a factory.

I'm cheating by having nicely cut sheets to start with but even a thin copper/brass sheet metal is stiff enouigh to be used a an enclosure.

Unless you plan using the enclosure for controlled crash experiments.

Ideally, one can of course mill enclosures out of solid aluminium or brass blocks but a 1" by 1" and 3/4" deeps alu enclosure takes almost a quarter of a day to mill if you require smooth surfaces and small cvuts to prevent heating and broken bits.

Also, by using milled alu or brass boxes, a temperature stabilizing factor is introduced. It takes time for these enclosures to change temperature if the outer temp is changing. Especially if the enclosures are mounted on a temp controlled base plate. It's simple to make an "oven" with a couple of lamps and a temp control.

Overkill? Yes of course :) but it shuts up the owners of professional (expensive) SA's.

//Dan, M0DFI

On Wednesday 07 September 2011 00:25:04 you wrote:
> Sam,
> I was thinking about the "making it square" problem too and how I would
> hold the plates together while soldering. Do you have a Home Depot skew
> number for those clamps or a jpeg even? Sometimes asking the store help
> doesn't always produce what you are looking for. If not I will try to
> describe it to them as best as I can and see what they produce. Also this
> site claims they will do custom cuts. I think I will go with .032".
> <http://www.onlinemetals.com/merchant.cfm?pid=1591&step=4&showunits=inches
> &id=1116&top_cat=79>
>
>
> Thanks much
> Vince
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
> > I used 0.032" brass for the sides. Each was a 4"x10" panel because I
> > could buy that size and didn't have to do any cutting, though I think 5"

> > x 12" would be ideal. I used brass angle much as Scotty describes,
> > except I did not put angle around the top of the sides, but rather put
> > it on the sides of the top cover (top and bottom covers were made of
> > 0.062" FR4), so it wouldn't be in the way when I took the cover off. I
> > also ended up putting a reinforcing bar of tiny brass angle from front
> > to back at center top, and ended up hanging my support grid from it.
> >
> > For brass angle, you have a choice of relatively thin material with wide
> > sides, or thicker material with narrower sides; I went with the latter.
> >
> > At Home Depot I found clamps designed to hold wood or sheet metal at
> > right angles, and it worked great. I could clamp two sides together, and
> > there was room to slide the brass angle on the corner and solder it. It
> > was the first box I ever made that was actually square.
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@>
wrote:
> > > Hi Vince,
> > > Good question. I used double sided .062 FR4 as panel enclosure. Very
> > > sturdy and easy to solder to. Â If you want to use brass, I would
> > > suggest anything between .031 (1/32) and .062 (1/16). Thick is fine,
> > > but difficult to solder. For either, you don't need much bracing. Your
> > > angle brackets will perform as bracing (3/4 inch triangles). Use one
> > > on each corner, on the top and on the bottom (8). They provide a place
> > > to screw down covers (top and bottom), and rubber feet (bottom). My
> > > bottom cover is held in place only when the threaded (6-32) rubber
> > > feet are installed. Your style of "egg carton" to hold the modules
> > > will also perform as bracing. Scotty
> > >
> > > --- On Mon, 9/5/11, VINCENTC <n1vc@> wrote:
> > >
> > > From: VINCENTC <n1vc@>
> > > Subject: [spectrumanalyzer] Brass Sheet Thickness
> > > To: spectrumanalyzer@yahoogroups.com
> > > Date: Monday, September 5, 2011, 12:47 AM
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> > > my enclosure using Brass panels. What thickness/gauge is preferable?
> > > Also what size angle brackets for re-enforcement?
> > >
> > > Thanks
> > >
> > > Vince

8461. Re: [spectrumanalyzer] Relay for Transmisson Reflection Bridge

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-07 12:07:17 UTC
From: Eric Nystrom
Topic: 8451 Message: 8461

Jim,

Thanks for the suggestion. That one does not appear to be available from
any of the usual sources either. Where did you find it?

Eric Nystrom

_____
From: Jim Hontoria <jghalpha@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Tuesday, September 6, 2011 7:20 PM
Subject: Re: [spectrumanalyzer] Relay for Transmisson Reflection Bridge

The AXICOM HF393 should do it for the bridge.

Jim H

On Tue, Sep 6, 2011 at 5:48 PM, Eric Nystrom <gloimon@yahoo.com> wrote:

>
>I am looking for parts for the Transmission Reflection Bridge and a
>HF3 56 Relay is specified. They don't appear to be available anywhere
>that I can find.
>
>
>
>Would the HF3 06 which is a 75 ohm relay work? I noticed that one was mentioned
>in a recent discussion for use with the band switching hardware.
>
>
>Eric Nystrom

--
Jim G. Hontoria

8462. Re: Relay for Transmisson Reflection Bridge

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-07 13:17:54 UTC
From: Sam
Topic: 8451 Message: 8462

If you are talking about my Transmission/Reflection bridge that combines the Active Bridge and buffer amp with a relay, you need a non-latching relay. For some reason, nobody seems to carry the 50-ohm versions any more, but Mouser has the 75-ohm HF3-06 that will work fine. It's nominally 12V, but the specs allow as low as 9V.

A note on the design in case anyone is designing their own: The bridge DUT port drives the DUT, whose output is buffered by the buffer amp and then runs to the Transmission leg of the relay. The reflection output from the bridge runs to the Reflection leg of the relay. It is very important that the DUT output sees the same load no matter what the relay setting, and ideally that load is 50 ohms. If it weren't for the buffer amp, the DUT would see high impedance when Reflection is selected, and the impedance of the MSA input when Transmission is selected. With the buffer amp, the DUT output is completely isolated from the relay setting. The bridge output is also isolated from the relay due to an op amp and attenuator. The attenuator's main purpose is actually to reduce the max reflection output, to avoid a strong reflection interfering with a weak transmission due to leakage in the relay.

The isolation from the relay is one reason that a 75-ohm relay is acceptable.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> Jim,
>
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> any of the usual sources either.Â Where did you find it?
> Â
> Eric Nystrom
>
>
> _____
> From: Jim Hontoria <jghalpha@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Tuesday, September 6, 2011 7:20 PM
> Subject: Re: [spectrumanalyzer] Relay for Transmisson Reflection Bridge
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>
> Â
> The AXICOM HF393 should do it for the bridge.
> Â
> Jim H
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>
> On Tue, Sep 6, 2011 at 5:48 PM, Eric Nystrom <gloimon@...> wrote:
>

>
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> >in a recent discussion for use with the band switching hardware.
> >
> >Â
> >Eric Nystrom
>
>
> --
> Jim G. Hontoria
>

8463. Re: Brass Sheet Thickness

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-07 13:31:36 UTC
From: Sam
Topic: 8451 Message: 8463

They are stamped Pony No. 9166, which is the only ID. You'll find them at Amazon if you search for Pony 9166. Buying them directly from Amazon is expensive, but there are some cheap alternatives through Amazon associates.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "VINCENTC" <n1vc@...> wrote:
>
> Sam,
> I was thinking about the "making it square" problem too and how I would hold the plates together while soldering. Do you have a Home Depot skew number for those clamps or a jpeg even? Sometimes asking the store help doesn't always produce what you are looking for. If not I will try to describe it to them as best as I can and see what they produce.
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> Thanks much
> Vince
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> > > Scotty
> > >
> > > --- On Mon, 9/5/11, VINCENTC <n1vc@> wrote:
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> > > From: VINCENTC <n1vc@>
> > > Subject: [spectrumanalyzer] Brass Sheet Thickness
> > > To: spectrumanalyzer@yahoogroups.com
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> > > Thanks

> > >
> > > Vince
> > >
> >
>

8464. Re: [spectrumanalyzer] Re: Relay for Transmisson Reflection Bridge

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-07 14:39:06 UTC
From: Eric Nystrom
Topic: 8451 Message: 8464

Sam,

I did some more searching and found that Newark has the 50 ohm not latching with
a 5v coil as part no 1-1462051-2 in case any one else is looking.

http://www.newark.com/te-connectivity-axicom/1-1462051-2/rf-signal-relay-spdt-5vdc-2a-pc/dp/63R6100

Eric Nystrom

From: Sam <swetterlin@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Wednesday, September 7, 2011 9:17 AM
Subject: [spectrumanalyzer] Re: Relay for Transmisson Reflection Bridge

If you are talking about my Transmission/Reflection bridge that combines the Active Bridge and buffer amp with a relay, you need a non-latching relay. For some reason, nobody seems to carry the 50-ohm versions any more, but Mouser has the 75-ohm HF3-06 that will work fine. It's nominally 12V, but the specs allow as low as 9V.

A note on the design in case anyone is designing their own: The bridge DUT port drives the DUT, whose output is buffered by the buffer amp and then runs to the Transmission leg of the relay. The reflection output from the bridge runs to the Reflection leg of the relay. It is very important that the DUT output sees the same load no matter what the relay setting, and ideally that load is 50 ohms. If it weren't for the buffer amp, the DUT would see high impedance when Reflection is selected, and the impedance of the MSA input when Transmission is selected. With the buffer amp, the DUT output is completely isolated from the relay setting. The bridge output is also isolated from the relay due to an op amp and attenuator. The attenuator's main purpose is actually to reduce the max reflection output, to avoid a strong reflection interfering with a weak transmission due to leakage in the relay.

The isolation from the relay is one reason that a 75-ohm relay is acceptable.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
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> Jim,
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> any of the usual sources either.Â Where did you find it?
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> Eric Nystrom
>
>

> _____
> From: Jim Hontoria <jghalpha@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Tuesday, September 6, 2011 7:20 PM
> Subject: Re: [spectrumanalyzer] Relay for Transmisson Reflection Bridge
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> Jim H
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> On Tue, Sep 6, 2011 at 5:48 PM, Eric Nystrom <gloimon@...> wrote:
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> >Â
> >Eric Nystrom
>
>
> --
> Jim G. Hontoria
>

8465. Re: Relay for Transmisson Reflection Bridge

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-10 21:48:36 UTC
From: jghbeta
Topic: 8451 Message: 8465

Eric,
I just went on Digikey and the HF306 is their number PB1105CT-ND. They seem to have enough of them at about $4.50.

Jim

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> Jim,
>
> Thanks for the suggestion.Â That one does not appear to be available from
> any of the usual sources either.Â Where did you find it?
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> Jim H
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> >Eric Nystrom
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>
> --
> Jim G. Hontoria
>

8466. Measuring output impedance?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-13 21:01:32 UTC
From: William Dillon
Topic: 8466 Message: 8466

Hi everyone,

Sorry if this verges on being off-topic, but I figure that there is likely to be some relevant expertise here. I would like to measure the output impedance of a device. I don't have access to the schematics of said device, so let's consider it a "black box". It's certainly possible to measure the output spectrum using the SA, but is it possible to accurately measure the output power without knowing the output impedance? The device in question has a soldered-in wire whip antenna. I was hoping to install a SMA connector to it, but I don't know if the design assumes some other impedance than 50 ohms.

Thanks in advance!
- Will
KD7VMY

8467. Re: Measuring output impedance?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-13 22:35:33 UTC
From: Sam
Topic: 8466 Message: 8467

It is true that the SA measures the output power of the device into a 50 ohm load. If the load is not 50 ohms, the actual output power will depend not only on the actual load impedance, but on the device output impedance.

As I understand your device, the "load" is the antenna. If you can remove the antenna and attach an SMA to the remaining device, and another SMA to the antenna, you can measure both the output impedance of the device-sans-antenna and the input impedance of the antenna, as well as the power output from the device-sans-antenna. There is some distortion because when the antenna is attached to the main device no SMA connectors were involved, but this will be a minimal issue if you are operating at relatively low frequency.

I don't have at hand the formula that would convert the SA measured power to power-into-actual-load, but I think it would be straightforward.

Measuring an output impedance is done just like measuring an input impedance, except that for power amps the output impedance may depend on output level, so you need to have the amp producing a signal to get an accurate measurement. This means it may not be feasible to hook the amp output directly to a bridge, because the amp output signal will get driven into the TG terminal. If you face that situation, see <http://groups.yahoo.com/group/VNWA/files/SWetterlin/MeasuringHotZout.pdf>

Sam W.

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> Hi everyone,
>
> Sorry if this verges on being off-topic, but I figure that there is likely to be some relevant expertise here. I would like to measure the output impedance of a device. I don't have access to the schematics of said device, so let's consider it a "black box". It's certainly possible to measure the output spectrum using the SA, but is it possible to accurately measure the output power without knowing the output impedance? The device in question has a soldered-in wire whip antenna. I was hoping to install a SMA connector to it, but I don't know if the design assumes some other impedance than 50 ohms.
>
> Thanks in advance!
> - Will
> KD7VMY
>

8468. Re: [spectrumanalyzer] Re: Measuring output impedance?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-13 22:47:11 UTC
From: Dan Andersson
Topic: 8466 Message: 8468

Will,

If you work on relatively low frequencies, try the simple way.

Connect a 0-1000 Ohm pot to a SMA. (or whatever coves your impedance to be measured)

Connect your impedance sotce > Power Meter > SMA with pot

Adjust pot for max power. Measure the resistance of the pot.

The higher the frequency, the more inaccuracies but below 100Mhz or so, it's very accurate.

//Dan, M0DFI

On Tuesday 13 September 2011 23:35:33 you wrote:
> It is true that the SA measures the output power of the device into a 50
> ohm load. If the load is not 50 ohms, the actual output power will depend
> not only on the actual load impedance, but on the device output impedance.
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> As I understand your device, the "load" is the antenna. If you can remove
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> to power-into-actual-load, but I think it would be straightforward.
>
> Measuring an output impedance is done just like measuring an input
> impedance, except that for power amps the output impedance may depend on
> output level, so you need to have the amp producing a signal to get an
> accurate measurement. This means it may not be feasible to hook the amp
> output directly to a bridge, because the amp output signal will get driven
> into the TG terminal. If you face that situation, see
> <http://groups.yahoo.com/group/VNWA/files/SWetterlin/MeasuringHotZout.pdf>
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
> > Hi everyone,
> >
> > Sorry if this verges on being off-topic, but I figure that there is

> > likely to be some relevant expertise here. I would like to measure the
> > output impedance of a device. I don't have access to the schematics of
> > said device, so let's consider it a "black box". It's certainly
> > possible to measure the output spectrum using the SA, but is it possible
> > to accurately measure the output power without knowing the output
> > impedance? The device in question has a soldered-in wire whip antenna.
> > I was hoping to install a SMA connector to it, but I don't know if the
> > design assumes some other impedance than 50 ohms.
> >
> > Thanks in advance!
> > - Will
> > KD7VMY

8469. Re: [spectrumanalyzer] Re: Measuring output impedance?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-13 23:01:04 UTC
From: William Dillon
Topic: 8466 Message: 8469

Thanks Sam and Dan!

That's pretty good info

I'm pending membership in the VNWA group, so I'll look at the document when I can.

For now, because I don't have a pass-through power meter that goes low enough for this device I think I may be able to use a directional coupler that I have with a spectrum analyzer. I like the simple idea of using the pot, I'll try that out.

```
* SA
|____|
DUT >------> POT
```

* = 50 ohm load

Also, I'm assuming that the directions are correct on the DC. I could always reverse them and measure fwd and reflected power as a final check.

Excuse the ASCII art :)

- Will

On Sep 13, 2011, at 3:47 PM, Dan Andersson wrote:

```
>
> Will,
>
> If you work on relatively low frequencies, try the simple way.
>
> Connect a 0-1000 Ohm pot to a SMA. ( or whatever coves your impedance to be
> measured )
>
> Connect your impedance sotce > Power Meter > SMA with pot
>
> Adjust pot for max power. Measure the resistance of the pot.
>
> The higher the frequency, the more inaccuracies but below 100Mhz or so, it's
> very accurate.
>
>
> //Dan, M0DFI
>
> On Tuesday 13 September 2011 23:35:33 you wrote:
>> It is true that the SA measures the output power of the device into a 50
>> ohm load. If the load is not 50 ohms, the actual output power will depend
>> not only on the actual load impedance, but on the device output impedance.
```

>>
>> As I understand your device, the "load" is the antenna. If you can remove
>> the antenna and attach an SMA to the remaining device, and another SMA to
>> the antenna, you can measure both the output impedance of the
>> device-sans-antenna and the input impedance of the antenna, as well as the
>> power output from the device-sans-antenna. There is some distortion
>> because when the antenna is attached to the main device no SMA connectors
>> were involved, but this will be a minimal issue if you are operating at
>> relatively low frequency.
>>
>> I don't have at hand the formula that would convert the SA measured power
>> to power-into-actual-load, but I think it would be straightforward.
>>
>> Measuring an output impedance is done just like measuring an input
>> impedance, except that for power amps the output impedance may depend on
>> output level, so you need to have the amp producing a signal to get an
>> accurate measurement. This means it may not be feasible to hook the amp
>> output directly to a bridge, because the amp output signal will get driven
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>> Sam W.
>>
>> --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>>> Hi everyone,
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>>> likely to be some relevant expertise here. I would like to measure the
>>> output impedance of a device. I don't have access to the schematics of
>>> said device, so let's consider it a "black box". It's certainly
>>> possible to measure the output spectrum using the SA, but is it possible
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>>> impedance? The device in question has a soldered-in wire whip antenna.
>>> I was hoping to install a SMA connector to it, but I don't know if the
>>> design assumes some other impedance than 50 ohms.
>>>
>>> Thanks in advance!
>>> - Will
>>> KD7VMY
>
>
> ------------------------------------
>
> Yahoo! Groups Links
>
>
>

8470. Re: [spectrumanalyzer] Re: Measuring output impedance?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-13 23:12:16 UTC
From: Dan Andersson
Topic: 8466 Message: 8470

Will,

Normally, we don't care abt the output impedance. Depending on the TX device, the output impedance is very un-linear. Depends on frequency and power.

To plot the output impedance, you need a 3D (XYZ) plot with Frequency, Power, Impedance in the XYZ order.

You need to have a good reason to bother with it.

//Dan, M0DFI

On Wednesday 14 September 2011 00:01:04 you wrote:
> Thanks Sam and Dan!
>
> That's pretty good info
>
> I'm pending membership in the VNWA group, so I'll look at the document when
> I can.
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> that I have with a spectrum analyzer. I like the simple idea of using the
> pot, I'll try that out.
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> * SA
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> |____|
>
> DUT >------> POT
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> * = 50 ohm load
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> Also, I'm assuming that the directions are correct on the DC. I could
> always reverse them and measure fwd and reflected power as a final check.
>
> Excuse the ASCII art :)
>
> - Will
>
> On Sep 13, 2011, at 3:47 PM, Dan Andersson wrote:
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> >
> > If you work on relatively low frequencies, try the simple way.
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> > be measured)
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> > Connect your impedance sotce > Power Meter > SMA with pot
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> > Adjust pot for max power. Measure the resistance of the pot.
> >
> > The higher the frequency, the more inaccuracies but below 100Mhz or so,
> > it's very accurate.
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> > //Dan, M0DFI
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> >> another SMA to the antenna, you can measure both the output impedance
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> >> f>
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> >> Sam W.
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> >>> Hi everyone,
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> >>> Sorry if this verges on being off-topic, but I figure that there is
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> >>> antenna. I was hoping to install a SMA connector to it, but I don't
> >>> know if the design assumes some other impedance than 50 ohms.
> >>>
> >>> Thanks in advance!
> >>> - Will
> >>> KD7VMY
> >
> > ----------
> >
> > Yahoo! Groups Links

8471. Re: [spectrumanalyzer] Measuring output impedance?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-13 23:19:33 UTC
From: William Dillon
Topic: 8466 Message: 8471

In this case I'm trying to make sure that the output of the "black box" transmitter is close enough to the input of a power amplifier. The frequency and power are fixed.

- Will

On Sep 13, 2011, at 4:12 PM, Dan Andersson wrote:

```
>
>
>
>
> Will,
>
> Normally, we don't care abt the output impedance. Depending on the TX device,
> the output impedance is very un-linear. Depends on frequency and power.
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> To plot the output impedance, you need a 3D ( XYZ ) plot with Frequency,
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> You need to have a good reason to bother with it.
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> //Dan, M0DFI
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>
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> On Wednesday 14 September 2011 00:01:04 you wrote:
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>> That's pretty good info
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>> I can.
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>> For now, because I don't have a pass-through power meter that goes low
>> enough for this device I think I may be able to use a directional coupler
>> that I have with a spectrum analyzer. I like the simple idea of using the
>> pot, I'll try that out.
>>
>> * SA
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>> DUT >------> POT
>>
>> * = 50 ohm load
>>
```

>> Also, I'm assuming that the directions are correct on the DC. I could
>> always reverse them and measure fwd and reflected power as a final check.
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>> - Will
>>
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>>>> device-sans-antenna and the input impedance of the antenna, as well as
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>>>> connectors were involved, but this will be a minimal issue if you are
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>>>> accurate measurement. This means it may not be feasible to hook the amp
>>>> output directly to a bridge, because the amp output signal will get

>>>> driven into the TG terminal. If you face that situation, see
>>>> <http://groups.yahoo.com/group/VNWA/files/SWetterlin/MeasuringHotZout.pd
>>>> f>
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>>>> Sam W.
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>>>> --- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...>
> wrote:
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>>>>>
>>>>> Sorry if this verges on being off-topic, but I figure that there is
>>>>> likely to be some relevant expertise here. I would like to measure the
>>>>> output impedance of a device. I don't have access to the schematics of
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>>>>> possible to accurately measure the output power without knowing the
>>>>> output impedance? The device in question has a soldered-in wire whip
>>>>> antenna. I was hoping to install a SMA connector to it, but I don't
>>>>> know if the design assumes some other impedance than 50 ohms.
>>>>>
>>>>> Thanks in advance!
>>>>> - Will
>>>>> KD7VMY
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>>> Yahoo! Groups Links
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8472. Cavity Filter Questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-14 12:38:57 UTC
From: Eric Nystrom
Topic: 8472 Message: 8472

I am ready to build my cavity filter and have some questions.

Will there be any significant difference in using copper vs brass for the center stub?

If copper pipe is used, should the end be plugged?

Any hints on the best way to strip the shield from RG402?

Thanks

Eric Nystrom

8473. Re: Measuring output impedance?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-14 12:48:10 UTC
From: william
Topic: 8466 Message: 8473

Hi Will,
Just for the sake of argument, you are wanting to match the output of a 440 MHz Handi-talki to an amplifier.
Alas, you are right, the antenna will not likely represent 50 ohms. Internal to the HT is a matching circuit between the final transistor and the rubber ducky antenna. Just replacing the antenna with a 50 ohm type SMA connector is a good start. You must then construct a matching circuit that converts the impedance of the missing antenna to 50 ohms. And, it must be extremely close to the removed antenna connection.
It it were me, I would build the matching circuit internally, between the antenna tie point and the new sma connector. Since this is fairly low power (under 5 watts), components will be small.

My suggestion would be to remove the antenna, and mount it in a similar arrangement on a sma connector. Then use the VNA to find the impedance of the antenna. The value would then be a good starting value for your new impedance matching circuit.
Scotty

--- In spectrumanalyzer@yahoogroups.com, William Dillon <hpux735@...> wrote:
>
> Hi everyone,
>
> Sorry if this verges on being off-topic, but I figure that there is likely to be some relevant expertise here. I would like to measure the output impedance of a device. I don't have access to the schematics of said device, so let's consider it a "black box". It's certainly possible to measure the output spectrum using the SA, but is it possible to accurately measure the output power without knowing the output impedance? The device in question has a soldered-in wire whip antenna. I was hoping to install a SMA connector to it, but I don't know if the design assumes some other impedance than 50 ohms.
>
> Thanks in advance!
> - Will
> KD7VMY
>

8474. Re: [spectrumanalyzer] Cavity Filter Questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-14 12:55:01 UTC
From: william sprowls
Topic: 8472 Message: 8474

Hi Eric,
Yes, but I couldn't predict it. I have never tried brass.
The center stub needs to be open at the top to allow the tuning screw to enter it (if necessary). The bottom may or may not be plugged. Makes no electrical difference. Wasps could enter a build a nest.
Scribe the circumference of the hard pipe with an Exacto knife and bend back and forth a couple of times. It will "snap".
Scotty

--- On Wed, 9/14/11, Eric Nystrom <gloimon@...m> wrote:

From: Eric Nystrom <gloimon@...>
Subject: [spectrumanalyzer] Cavity Filter Questions
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Wednesday, September 14, 2011, 7:38 AM

I am ready to build my cavity filter and have some questions.
Will there be any significant difference in using copper vs brass for the center stub?
If copper pipe is used, should the end be plugged?
Any hints on the best way to strip the shield from RG402?
Thanks
 Eric Nystrom

8475. Re: Cavity Filter Questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-14 13:50:38 UTC
From: Sam
Topic: 8472 Message: 8475

I have used brass for the bodies (not the rods) of cavity filters. It increases the insertion loss (I don't recall the amount) due to its higher resistivity. The large surface area of the cavity wall somewhat reduces the importance of resistivity, but with the far smaller surface area of the rod I would expect brass to at least double the insertion loss. Silver plating the rod would solve the problem; it wouldn't be necessary to plate the entire cavity.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Eric,
> Yes, but I couldn't predict it. I have never tried brass.
> The center stub needs to be open at the top to allow the tuning screw to enter it (if necessary). The bottom may or may not be plugged. Makes no electrical difference. Wasps could enter a build a nest.
> Scribe the circumference of the hard pipe with an Exacto knife and bend back and forth a couple of times. It will "snap".
> Scotty
>
> --- On Wed, 9/14/11, Eric Nystrom <gloimon@...> wrote:
>
> From: Eric Nystrom <gloimon@...>
> Subject: [spectrumanalyzer] Cavity Filter Questions
> To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
> Date: Wednesday, September 14, 2011, 7:38 AM
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> Thanks
> Â Eric Nystrom
>

8476. PLO 1 Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-14 22:20:06 UTC
From: Eric Nystrom
Topic: 8476 Message: 8476

I am building the VNA version and have built two of the PLO 1 modules. One works and the other fails to lock.

On the one that fails, all the voltage and current readings are good except for the loop balance
voltage and the VCO control voltage. I measured the VCO control voltage and noticed that when I power it up and start the software, the voltage slowly drifts up to around 19 volts. If I
use the volt meter to check the 4118 output on pin 2, the VCO control voltage goes to 19 volts
right away.
Any suggestions of further tests?

Thanks.

Eric Nystrom

8477. Re: [spectrumanalyzer] PLO 1 Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-15 02:55:43 UTC
From: william sprowls
Topic: 8476 Message: 8477

Hi Eric,
  This would indicate that the PLL pin 2 is "floating", in a Hi-Z mode. The op amp circuit sounds like it is working. I believe that the PLL chip will power up in a mode called "standby" and will stay there until it receives the proper command (from the control board). The "standby" mode will cause pin 2 to float.
  Make sure your comparisons of the two PLO's are "apples to apples". That is, if PLO 1 is working fine in its position as PLO1, then remove it and replace it with the non-functional PLO in that position. This guarantees the same input signals to the modules. If still non-functional, you can eliminate possible external failures, such as a bad clock from the DDS or a bad command from the Control Board.
  Of course, I always suggest a triple inspection of solder joints on the PLL chip (especially pin 2).
Scotty

--- On Wed, 9/14/11, Eric Nystrom <gloimon@yahoo.com> wrote:

From: Eric Nystrom <gloimon@...>
Subject: [spectrumanalyzer] PLO 1 Debugging
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Wednesday, September 14, 2011, 5:20 PM

I am building the VNA version and have built two of the PLO 1 modules. One worksand the other fails to lock.
On the one that fails, all the voltage and current readings are good except for the loop balancevoltage and the VCO control voltage. I measured the VCO control voltage and noticed thatwhen I power it up and start the software, the voltage slowly drifts up to around 19 volts. If Iuse the volt meter to check the 4118 output on pin 2, the VCO control voltage goes to 19 voltsright away.
Any suggestions of further tests?

Thanks.

Eric Nystrom

8478. Re: [spectrumanalyzer] PLO 1 Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-15 10:57:21 UTC
From: Eric Nystrom
Topic: 8476 Message: 8478

Scotty,

Thanks for the suggestions. The control wiring is attached with connectors so everything is
common between the tests except the boards. I checked all the soldering again and touched it up to make sure. I also checked the three control lines with an oscilloscope and the signals
are getting to the pins at the chip.

Have you ever tried programming the functions on the MUXOUT pin for this chip? It would be a way to verify the chip is working by viewing the outputs of the R and N counters.

I will order another 4118 and replace it and see what happens.

Eric Nystrom

From: william sprowls <wsprowls@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Wednesday, September 14, 2011 10:55 PM
Subject: Re: [spectrumanalyzer] PLO 1 Debugging

Hi Eric,
  This would indicate that the PLL pin 2 is "floating", in a Hi-Z mode. The op amp circuit sounds like it is working. I believe that the PLL chip will power up in a mode called "standby" and will stay there until it receives the proper command (from the control board). The "standby" mode will cause pin 2 to float.
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Scotty

--- On Wed, 9/14/11, Eric Nystrom <gloimon@...> wrote:

>From: Eric Nystrom <gloimon@...>
>Subject: [spectrumanalyzer] PLO 1 Debugging
>To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
>Date: Wednesday, September 14, 2011, 5:20 PM
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>use the volt meter to check the 4118 output on pin 2, the VCO control voltage goes to 19 volts
>right away.
>Any suggestions of further tests?
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>Thanks.
>
>
>
>Eric Nystrom

8479. Re: [spectrumanalyzer] PLO 1 Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-15 12:45:31 UTC
From: Neganur
Topic: 8476 Message: 8479

Did you buy the PLL on ebay, by chance? I had similar issues. Guess it was a lemon.

BR

Chris

On 15 Sep 2011, at 13:57, Eric Nystrom <gloimon@yahoo.com> wrote:

> Scotty,
>
> Thanks for the suggestions. The control wiring is attached with connectors so everything is
> common between the tests except the boards. I checked all the soldering again and touched
> it up to make sure. I also checked the three control lines with an oscilloscope and the signals
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> Eric Nystrom
> From: william sprowls <wsprowls@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Wednesday, September 14, 2011 10:55 PM
> Subject: Re: [spectrumanalyzer] PLO 1 Debugging
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> From: Eric Nystrom <gloimon@...>
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> To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
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> Thanks.
>
> Eric Nystrom
>
>
>

8480. Re: [spectrumanalyzer] PLO 1 Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-15 13:58:23 UTC
From: Eric Nystrom
Topic: 8476 Message: 8480

Chris,

No, mine was from Digi-Key.

Eric Nystrom

_____
From: Neganur <neganur@...>
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Sent: Thursday, September 15, 2011 8:45 AM
Subject: Re: [spectrumanalyzer] PLO 1 Debugging

Did you buy the PLL on ebay, by chance? I had similar issues. Guess it was a lemon.

BR

Chris

On 15 Sep 2011, at 13:57, Eric Nystrom <gloimon@...> wrote:

>Scotty,
>
>
>Thanks for the suggestions. The control wiring is attached with connectors so everything is
>common between the tests except the boards. I checked all the soldering again and touched
>it up to make sure. I also checked the three control lines with an oscilloscope and the signals
>are getting to the pins at the chip.
>
>
>Have you ever tried programming the functions on the MUXOUT pin for this chip? It would be
>a way to verify the chip is working by viewing the outputs of the R and N counters.
>
>
>
>I will order another 4118 and replace it and see what happens.
>
>
>Eric Nystrom
>
>
>_____
>From: william sprowls <wsprowls@...>
>To: spectrumanalyzer@yahoogroups.com
>Sent: Wednesday, September 14, 2011 10:55 PM

>Subject: Re: [spectrumanalyzer] PLO 1 Debugging
>
>
>
>Hi Eric,
> This would indicate that the PLL pin 2 is "floating", in a Hi-Z mode. The op amp circuit sounds like it is working. I believe that the PLL chip will power up in a mode called "standby" and will stay there until it receives the proper command (from the control board). The "standby" mode will cause pin 2 to float.
> Make sure your comparisons of the two PLO's are "apples to apples". That is, if PLO 1 is working fine in its position as PLO1, then remove it and replace it with the non-functional PLO in that position. This guarantees the same input signals to the modules. If still non-functional, you can eliminate possible external failures, such as a bad clock from the DDS or a bad command from the Control Board.
> Of course, I always suggest a triple inspection of solder joints on the PLL chip (especially pin
2).
>Scotty
>
>--- On Wed, 9/14/11, Eric Nystrom <gloimon@yahoo.com> wrote:
>
>
>>From: Eric Nystrom <gloimon@...>
>>Subject: [spectrumanalyzer] PLO 1 Debugging
>>To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
>>Date: Wednesday, September 14, 2011, 5:20 PM
>>
>>
>>
>>I am building the VNA version and have built two of the PLO 1 modules. One works
>>and the other fails to lock.
>>
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>>On the one that fails, all the voltage and current readings are good except for the loop balance
>>voltage and the VCO control voltage. I measured the VCO control voltage and noticed that
>>when I power it up and start the software, the voltage slowly drifts up to around 19 volts. If I
>>use the volt meter to check the 4118 output on pin 2, the VCO control voltage goes to 19 volts
>>right away.
>>Any suggestions of further tests?
>>
>>Thanks.
>>
>>
>>
>>Eric Nystrom
>
>

8481. Re: [spectrumanalyzer] PLO 1 Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-15 14:05:57 UTC
From: SFC
Topic: 8476 Message: 8481

Hi,

If you want to experiment with the communication and settings of the pll chip I'd suggest you visit the site of analog devices. You can download a nice free tool to try out various pll chips. It works with an easy diy interface cable on the parallel port.

Simon

----- Original Message -----
From: Eric Nystrom
To: spectrumanalyzer@yahoogroups.com
Sent: Thursday, September 15, 2011 12:57 PM
Subject: Re: [spectrumanalyzer] PLO 1 Debugging

Scotty,

Thanks for the suggestions. The control wiring is attached with connectors so everything is common between the tests except the boards. I checked all the soldering again and touched it up to make sure. I also checked the three control lines with an oscilloscope and the signals
are getting to the pins at the chip.

Have you ever tried programming the functions on the MUXOUT pin for this chip? It would be a way to verify the chip is working by viewing the outputs of the R and N counters.

I will order another 4118 and replace it and see what happens.

Eric Nystrom

From: william sprowls <wsprowls@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Wednesday, September 14, 2011 10:55 PM
Subject: Re: [spectrumanalyzer] PLO 1 Debugging

Hi Eric,
This would indicate that the PLL pin 2 is "floating", in a Hi-Z mode. The op amp circuit sounds like it is working. I believe that the PLL chip will power up in a mode called "standby" and will stay there until it receives the proper command (from the control board). The "standby" mode will cause pin 2 to float.
Make sure your comparisons of the two PLO's are "apples to apples". That is, if PLO 1 is working fine in its position as PLO1, then remove it and replace it with the non-functional PLO in that position. This guarantees the same input signals to the modules. If still non-functional, you can eliminate possible external failures, such as a bad clock from the DDS or a bad command from the Control Board.
Of course, I always suggest a triple inspection of solder joints on the PLL chip (especially pin 2).

Scotty

--- On Wed, 9/14/11, Eric Nystrom <gloimon@...> wrote:

From: Eric Nystrom <gloimon@...>
Subject: [spectrumanalyzer] PLO 1 Debugging
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Wednesday, September 14, 2011, 5:20 PM

I am building the VNA version and have built two of the PLO 1 modules. One works
and the other fails to lock.

On the one that fails, all the voltage and current readings are good except for the loop
balance
voltage and the VCO control voltage. I measured the VCO control voltage and noticed that
when I power it up and start the software, the voltage slowly drifts up to around 19 volts.
If I
use the volt meter to check the 4118 output on pin 2, the VCO control voltage goes to 19
volts
right away.

Any suggestions of further tests?

Thanks.

Eric Nystrom

8482. Re: [spectrumanalyzer] PLO 1 Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-15 14:27:27 UTC
From: william sprowls
Topic: 8476 Message: 8482

Hi Eric,
 I have with the LMX2326 but I don't have the 4118 to verify. Should be the same. Here is how to program the PLL chip to allow pin 14 to show results:
In the spectrumanalyzer.bas code find [Command2326R].
Bits N4-N6 control pin 14:
default Code for LMX2326

```
    N6=0        'FoLD control(pin14 output), 0= tristate, 1= R Divider out
    N5=0        '2= N Divider out, 3= Serial Data Output, 4= Digital Lock Detect
    N4=0        '5= Open drain lock detect, 6= High output, 7= Low output
```

The ADF4118 is different, so just change the bits to get the following:

```
    N6=1        4= R Divider out on pin 14

    N5=0

    N4=0

    N6=0

    N5=1        '2= N Divider out on pin 14

    N4=0

    N6=1

    N5=1

    N4=0        6= Serial command, inverted, on pin 14

    N6=0

    N5=1

    N4=1        3= AVdd output on pin 14 (5 volts)

    N6=1

    N5=1

    N4=1        7= Low output on pin 14 (0 volts)
```

These last two prove the PLL chip is getting a proper command and can be measured with a voltmeter.

Scotty

--- On Thu, 9/15/11, Eric Nystrom <gloimon@...> wrote:

From: Eric Nystrom <gloimon@...>
Subject: Re: [spectrumanalyzer] PLO 1 Debugging

To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Thursday, September 15, 2011, 5:57 AM

Scotty,
Thanks for the suggestions. The control wiring is attached with connectors so everything iscommon between the tests except the boards. I checked all the soldering again and touchedit up to make sure. I also checked the three control lines with an oscilloscope and the signalsare getting to the pins at the chip.
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I will order another 4118 and replace it and see what
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Make sure your comparisons of the two PLO's are "apples to apples". That is, if PLO 1 is working fine in its position as PLO1, then remove it and replace it with the non-functional PLO in that position. This guarantees the same input signals to the modules. If still non-functional, you can eliminate possible external failures, such as a bad clock from the DDS or a bad command from the Control Board.
Of course, I always suggest a triple inspection of solder joints on the PLL chip (especially pin
2).
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Any suggestions of further tests?

Thanks.

Eric Nystrom

8483. Re: [spectrumanalyzer] PLO 1 Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-15 18:54:58 UTC
From: Eric Nystrom
Topic: 8476 Message: 8483

Scotty,

Thanks for the help. I did the test of setting MUXOUT to output AVdd. On the good board the output was as expected and on the one that was not working, it stayed at 0 volts. I have removed the chip and ordered another one.

Eric Nystrom

From: william sprowls <wsprowls@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Thursday, September 15, 2011 10:27 AM
Subject: Re: [spectrumanalyzer] PLO 1 Debugging

Hi Eric,
 I have with the LMX2326 but I don't have the 4118 to verify. Should be the same. Here is how to program the PLL chip to allow pin 14 to show results:
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These last two prove the PLL chip is getting a proper command and can be measured with a voltmeter.

Scotty

--- On Thu, 9/15/11, Eric Nystrom <gloimon@...> wrote:

>From: Eric Nystrom <gloimon@...>
>Subject: Re: [spectrumanalyzer] PLO 1 Debugging
>To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
>Date: Thursday, September 15, 2011, 5:57 AM
>
>
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>Scotty,
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>
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>From: william sprowls <wsprowls@...>
>To: spectrumanalyzer@yahoogroups.com
>Sent: Wednesday, September 14, 2011 10:55 PM
>Subject: Re: [spectrumanalyzer] PLO 1 Debugging
>
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>Hi Eric,
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>--- On Wed, 9/14/11, Eric Nystrom <gloimon@...> wrote:
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>>Subject: [spectrumanalyzer] PLO 1 Debugging
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>>Date: Wednesday, September 14, 2011, 5:20 PM
>>
>>
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>>use the volt meter to check the 4118 output on pin 2, the VCO control voltage goes to 19 volts
>>right away.
>>Any suggestions of further tests?
>>
>>Thanks.
>>
>>
>>
>>Eric Nystrom
>
>

8484. Re: Cavity Filter Questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-15 20:25:49 UTC
From: ed_k7ock
Topic: 8472 Message: 8484

I used 1/4 " solid brass rod for the cavity filter,threaded on one end so I could do the adjustments. Fortunately I had access to the Agilent FieldFox network/spectrum analyzer to do the adjustments.I was able to get it adjusted to the correct center frequency with about 3 MHz bandwidth, if I remember correctly the insertion loss was a little over 8 dB and the image rejection was close to 90 dB.

Now if I can get my act together, I will finalize the construction and start cal.

Ed

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have used brass for the bodies (not the rods) of cavity filters. It increases the insertion loss (I don't recall the amount) due to its higher resistivity. The large surface area of the cavity wall somewhat reduces the importance of resistivity, but with the far smaller surface area of the rod I would expect brass to at least double the insertion loss. Silver plating the rod would solve the problem; it wouldn't be necessary to plate the entire cavity.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> >
> > Hi Eric,
> > Yes, but I couldn't predict it. I have never tried brass.
> > The center stub needs to be open at the top to allow the tuning screw to enter it (if necessary). The bottom may or may not be plugged. Makes no electrical difference. Wasps could enter a build a nest.
> > Scribe the circumference of the hard pipe with an Exacto knife and bend back and forth a couple of times. It will "snap".
> > Scotty
> >
> > --- On Wed, 9/14/11, Eric Nystrom <gloimon@> wrote:
> >
> > From: Eric Nystrom <gloimon@>
> > Subject: [spectrumanalyzer] Cavity Filter Questions
> > To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
> > Date: Wednesday, September 14, 2011, 7:38 AM
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> > I am ready to build my cavity filter and have some questions.
> > Will there be any significant difference in using copper vs brass for the center stub?
> > If copper pipe is used, should the end be plugged?
> > Any hints on the best way to strip the shield from RG402?
> > Thanks
> > Â Eric Nystrom
> >
>

8485. Band switching software bug

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-17 14:39:08 UTC
From: jghbeta
Topic: 8485 Message: 8485

Sam, Scotty,

It appears there is a glitch in the 1G-2G selection software.
Tried to switch to 2G and got a message "Sig-Gen was out of band. Changed to 10.0" Then nothing happens and the hour glass stays for ever. The Sig. gen, in any case was 10 MHz to begin with. The good news is that the bits flip , the bad is that the Restart button becomes inoperative.

Jim, W1JGH

8486. Re: [spectrumanalyzer] PLO 1 Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-17 18:54:50 UTC
From: Eric Nystrom
Topic: 8476 Message: 8486

I replaced the 4118 on the PLO and it now works. I had low output on J3 so I replace U8. Now the output from J2 and J3 are similar.

I have uploaded some files to the following folder.

http://groups.yahoo.com/group/spectrumanalyzer/files/Eric%20W4EON

I was wondering if the wider area the is at roughly -60db on the photo labeled PLO 1 Power Test is correct or indicates the PLO is not locked correctly.

I have also uploaded a file for the PLO 3 Power Test. Does it look correct?

Thanks

Eric Nystrom

8487. Re: Band switching software bug

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-17 20:30:26 UTC
From: Sam
Topic: 8485 Message: 8487

Jim,
I suspect a message was printed on the message line, about a PLL error. When you click Restart, it creates the same error, prints the same message, and stops.

In any case, there is an error as to how the signal generator is set for SA mode when not in 1G. The signal generator shouldn't even care what band you are in; it is a freebie feature that operates on its own, making use of LO3 which would otherwise be unused. I am revising it so it will create the desired frequency (sgout) as follows:

sgout=LO3-LO2 if sgout<LO2
sgout=LO3 if sgout>=LO2 and sgout<2*LO2
sgout=LO3+LO2 if sgout>=2*LO2

These ranges allow LO3 to be set somewhere between LO2 and 2*LO2. Unless your +20 supply is very weak, LO3 should be able to cover this range.

Note that all three of these frequencies are always contained in the TG/SG output. It's just a question of which one we make equal to sgout.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> Sam, Scotty,
>
> It appears there is a glitch in the 1G-2G selection software.
> Tried to switch to 2G and got a message "Sig-Gen was out of band. Changed to 10.0" Then nothing happens and the hour glass stays for ever. The Sig. gen, in any case was 10 MHz to begin with. The good news is that the bits flip , the bad is that the Restart button becomes inoperative.
>
> Jim, W1JGH
>

8488. Re: PLO 1 Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-17 20:38:43 UTC
From: Sam
Topic: 8476 Message: 8488

Eric,
I believe that stairstep pattern, which for PLO1 creates the step at -60 dBm, is caused by frequency modulation of the VCO. There seems to be a bit of it for PLO3 also. The modulation is likely caused by ripple on the +20V line. You probably need to replace or double up on the 10 uF filter caps on the +20V line on the PLO boards, and also back at the voltage doubler on the control board. Use ceramic X5R or X7R capacitors, 25V or higher.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
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> U8. Now the output from J2 and J3 are similar.
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>
> http://groups.yahoo.com/group/spectrumanalyzer/files/Eric%20W4EON
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> I was wondering if the wider area the is at roughly -60db on the photo labeled PLO 1
Power
> Test is correct or indicates the PLO is not locked correctly.
>
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>
>
> Thanks
>
>
> Eric Nystrom
>
>
> _____
>

8489. Re: [spectrumanalyzer] Re: PLO 1 Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-18 00:32:23 UTC
From: william sprowls
Topic: 8476 Message: 8489

Hi Eric,
 One way to determine if the voltage doubler has too much ripple is to "kill" its oscillator. A good way to do this is to moisten your finger and press your finger on the pins of the multiplier I.C. Its internal oscillator is easily stopped this way. When stopped, the doubling action ceases and the +20v line will drop to about +9 volts (with absolutely no ripple). 9v is more than enough for PLO1 or PLO 3 to operate and lock at their lower frequencies (MSA or Sig Gen commanded to less than 200 MHz).
This was a "trick" I found accidentally. It will begin oscillating again once the pwb dries. To the "purist" who wants to blast me for the suggestion, save your breath!
Scotty

--- On Sat, 9/17/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: PLO 1 Debugging
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, September 17, 2011, 3:38 PM

Eric,

I believe that stairstep pattern, which for PLO1 creates the step at -60 dBm, is caused by frequency modulation of the VCO. There seems to be a bit of it for PLO3 also. The modulation is likely caused by ripple on the +20V line. You probably need to replace or double up on the 10 uF filter caps on the +20V line on the PLO boards, and also back at the voltage doubler on the control board. Use ceramic X5R or X7R capacitors, 25V or higher.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:

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>

> Thanks

>

>

> Eric Nystrom

>

>

> _____

>

8490. Re: [spectrumanalyzer] Band switching software bug

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-18 14:30:14 UTC
From: Jim Hontoria
Topic: 8485 Message: 8490

Sam,
The mesage, which I didn't notice before, that shows up in the message line
is "PLL 1, 4112R counter <3".

Jim W1JGH

On Sat, Sep 17, 2011 at 10:39 AM, jghbeta <jghalpha@...> wrote:

> **
>
>
> Sam, Scotty,
>
> It appears there is a glitch in the 1G-2G selection software.
> Tried to switch to 2G and got a message "Sig-Gen was out of band. Changed
> to 10.0" Then nothing happens and the hour glass stays for ever. The Sig.
> gen, in any case was 10 MHz to begin with. The good news is that the bits
> flip , the bad is that the Restart button becomes inoperative.
>
> Jim, W1JGH
>
>
>

--
Jim G. Hontoria

8491. Re: Band switching software bug

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-18 15:00:30 UTC
From: Sam
Topic: 8485 Message: 8491

Jim,
I believe what happened is you changed to 2G but did not change the frequency range to something within 2G. So PLL 1 was trying to be set to an unreachable frequency.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> Sam,
> The mesage, which I didn't notice before, that shows up in the message line
> is "PLL 1, 4112R counter <3".
>
> Jim W1JGH
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> On Sat, Sep 17, 2011 at 10:39 AM, jghbeta <jghalpha@...> wrote:
>
> > **
> >
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> > Sam, Scotty,
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> > It appears there is a glitch in the 1G-2G selection software.
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> > Jim, W1JGH
> >
> >
> >
>
>
>
> --
> Jim G. Hontoria
>

8492. Re: [spectrumanalyzer] Re: Band switching software bug

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-18 16:07:53 UTC
From: Jim Hontoria
Topic: 8485 Message: 8492

Yep, that was it.

Thanks, Jim

On Sun, Sep 18, 2011 at 11:00 AM, Sam <swetterlin@...> wrote:

> **
>
>
> Jim,
> I believe what happened is you changed to 2G but did not change the
> frequency range to something within 2G. So PLL 1 was trying to be set to an
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> Sam W.
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> --- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...>
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> > --
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>

--
Jim G. Hontoria

8493. Setting master oscillator frequency

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-18 22:31:05 UTC
From: Steve
Topic: 8493 Message: 8493

Scotty,

The Initial Set-Up and Calibrationfor the MSA
<http://www.scottyspectrumanalyzer.com/msasetcal.html> web page
describes two beat frequency methods for establishing the master
oscillator frequency.

As an alternative, can the MO frequency be determined by commanding the
tracking generator to 64MHz and reading its output on a frequency
counter? That reading can then be entered into the Mast Clock field on
the Configuration Manager window?

Thanks.

Steve K8JQ

--
Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

8494. Re: [spectrumanalyzer] Setting master oscillator frequency

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-19 01:26:00 UTC
From: william sprowls
Topic: 8493 Message: 8494

Hi Steve,
 Good question. But, no, the TG can be significantly off its command frequency (+/- 1.3 Hz). This is due to the fact that the DDS is always "rounded off" to its least significant bit. This is an error of only .014 Hz at 10.7 MHz (the DDS output). However, since the 10.7 gets multiplied up to the PLO operating frequency by a factor of 95 or more, so does the error. (95 x .014 Hz = 1.33 Hz). This doesn't sound like much of an error but it really is.

The direct output of the DDS is the easiest MSA source to beat with WWV, since it's error will never be greater than .014 Hz.

Actually, the Master Clock could be measured by a freq counter, but freq counters have error too.
 WWV has no frequency error. (Doppler enthusiasts, leave me alone).
Scotty

--- On Sun, 9/18/11, Steve <steve65@...t> wrote:

From: Steve <steve65@...>
Subject: [spectrumanalyzer] Setting master oscillator frequency
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, September 18, 2011, 5:31 PM

Scotty,

The Initial Set-Up and Calibrationfor the MSA

<http://www.scottyspectrumanalyzer.com/msasetcal.html> web page

describes two beat frequency methods for establishing the master

oscillator frequency.

As an alternative, can the MO frequency be determined by commanding the

tracking generator to 64MHz and reading its output on a frequency

counter? That reading can then be entered into the Mast Clock field on

the Configuration Manager window?

Thanks.

Steve K8JQ

--

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8495. Re: [spectrumanalyzer] Setting master oscillator frequency

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-19 02:08:55 UTC
From: Steve
Topic: 8493 Message: 8495

OK, it seemed too easy :-)

I had already constructed the DDS's and boxed them up before realizing
that I should have made the spare outputs available. Absent spare
outputs, neither of the zero-beat methods are available to me.

What I can do, however, is disconnect one of the MO outputs and measure
it with a frequency counter whose time base is the output of a GPS
receiver.
"Doppler enthusiasts" consider that better than WWV :-)

I have finally got my MSA packaged and was hoping the TG output would
work so I wouldn't have to disassemble the unit . . . sigh.

Steve K8JQ

On 9/18/2011 9:26 PM, william sprowls wrote:
>
>
> Hi Steve,
> Good question. But, no, the TG can be significantly off its command
> frequency (+/- 1.3 Hz). This is due to the fact that the DDS is always
> "rounded off" to its least significant bit. This is an error of only
> .014 Hz at 10.7 MHz (the DDS output). However, since the 10.7 gets
> multiplied up to the PLO operating frequency by a factor of 95 or
> more, so does the error. (95 x .014 Hz = 1.33 Hz). This doesn't sound
> like much of an error but it really is.
>
> The direct output of the DDS is the easiest MSA source to beat with
> WWV, since it's error will never be greater than .014 Hz.
>
> Actually, the Master Clock could be measured by a freq counter, but
> freq counters have error too.
> WWV has no frequency error. (Doppler enthusiasts, leave me alone).
> Scotty
>
> --- On *Sun, 9/18/11, Steve /<steve65@...>/* wrote:
>
>
> From: Steve <steve65@...>
> Subject: [spectrumanalyzer] Setting master oscillator frequency
> To: spectrumanalyzer@yahoogroups.com
> Date: Sunday, September 18, 2011, 5:31 PM
>
> Scotty,
>

> The Initial Set-Up and Calibrationfor the MSA
> <http://www.scottyspectrumanalyzer.com/msasetcal.html> web page
> describes two beat frequency methods for establishing the master
> oscillator frequency.
>
> As an alternative, can the MO frequency be determined by
> commanding the
> tracking generator to 64MHz and reading its output on a frequency
> counter? That reading can then be entered into the Mast Clock
> field on
> the Configuration Manager window?
>
> Thanks.
>
> Steve K8JQ
>
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>
>
>
>

--
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8496. Re: [spectrumanalyzer] Setting master oscillator frequency

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-19 02:18:35 UTC
From: Jim Hontoria
Topic: 8493 Message: 8496

How about my trusty, GPS disciplined, 10MHz oscillator?

Jim W1JGH

On Sun, Sep 18, 2011 at 9:26 PM, william sprowls <wsprowls@...> wrote:

> **
>
>
> Hi Steve,
> Good question. But, no, the TG can be significantly off its command
> frequency (+/- 1.3 Hz). This is due to the fact that the DDS is always
> "rounded off" to its least significant bit. This is an error of only .014 Hz
> at 10.7 MHz (the DDS output). However, since the 10.7 gets multiplied up to
> the PLO operating frequency by a factor of 95 or more, so does the error.
> (95 x .014 Hz = 1.33 Hz). This doesn't sound like much of an error but it
> really is.
>
> The direct output of the DDS is the easiest MSA source to beat with WWV,
> since it's error will never be greater than .014 Hz.
>
> Actually, the Master Clock could be measured by a freq counter, but freq
> counters have error too.
> WWV has no frequency error. (Doppler enthusiasts, leave me alone).
> Scotty
>
> --- On *Sun, 9/18/11, Steve <steve65@...>* wrote:
>
>
> From: Steve <steve65@suddenlink.net>
> Subject: [spectrumanalyzer] Setting master oscillator frequency
> To: spectrumanalyzer@yahoogroups.com
> Date: Sunday, September 18, 2011, 5:31 PM
>
>
>
>
> Scotty,
>
> The Initial Set-Up and Calibrationfor the MSA
> <http://www.scottyspectrumanalyzer.com/msasetcal.html> web page
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> oscillator frequency.
>
> As an alternative, can the MO frequency be determined by commanding the
> tracking generator to 64MHz and reading its output on a frequency

> counter? That reading can then be entered into the Mast Clock field on
> the Configuration Manager window?
>
> Thanks.
>
> Steve K8JQ
>
> --
> Read The Patriot Post Vertitas vos Liberabit
> http://patriotpost.us/subscription/
>
>
>

--
Jim G. Hontoria

8497. Why are there two DDS

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-19 02:27:07 UTC
From: jghbeta
Topic: 8497 Message: 8497

Do we really need two DDS which generate a 10.7 MHz reference?. Could we just have one and split the output? Am I missing something I shouldn't be?

Jim W1JGH

8498. Re: [spectrumanalyzer] Why are there two DDS

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-19 03:50:29 UTC
From: william sprowls
Topic: 8497 Message: 8498

Two PLO's at two different frequencies. Each requires an independent DDS to "steer" it.
Scotty

--- On Sun, 9/18/11, jghbeta <jghalpha@...> wrote:

From: jghbeta <jghalpha@...>
Subject: [spectrumanalyzer] Why are there two DDS
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, September 18, 2011, 9:27 PM

Do we really need two DDS which generate a 10.7 MHz reference?. Could we just have one and split the output? Am I missing something I shouldn't be?

Jim W1JGH

8499. Re: Why are there two DDS

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-19 12:40:39 UTC
From: Sam
Topic: 8497 Message: 8499

The DDS frequencies are not fixed at 10.7 MHz. They are adjusted by tiny amounts to fine tune the PLO frequencies at each scan point.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> Do we really need two DDS which generate a 10.7 MHz reference?. Could we just have one and split the output? Am I missing something I shouldn't be?
>
> Jim W1JGH
>

8500. Re: Setting master oscillator frequency

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-19 12:54:35 UTC
From: Sam
Topic: 8493 Message: 8500

Scotty,
Maybe it would be useful to calculate the actual SG output frequency when it is set to 10 MHz and/or 64 MHz, for anyone who wants to use a (reliable) frequency counter to determine the MO frequency. Maybe this depends on the PLL used, but there are only 2 or 3 types actually in use.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
>
> OK, it seemed too easy :-)
>
> I had already constructed the DDS's and boxed them up before realizing
> that I should have made the spare outputs available. Absent spare
> outputs, neither of the zero-beat methods are available to me.
>
> What I can do, however, is disconnect one of the MO outputs and measure
> it with a frequency counter whose time base is the output of a GPS
> receiver.
> "Doppler enthusiasts" consider that better than WWV :-)
>
> I have finally got my MSA packaged and was hoping the TG output would
> work so I wouldn't have to disassemble the unit . . . sigh.
>
> Steve K8JQ
>
> On 9/18/2011 9:26 PM, william sprowls wrote:
> >
> >
> > Hi Steve,
> > Good question. But, no, the TG can be significantly off its command
> > frequency (+/- 1.3 Hz). This is due to the fact that the DDS is always
> > "rounded off" to its least significant bit. This is an error of only
> > .014 Hz at 10.7 MHz (the DDS output). However, since the 10.7 gets
> > multiplied up to the PLO operating frequency by a factor of 95 or
> > more, so does the error. (95 x .014 Hz = 1.33 Hz). This doesn't sound
> > like much of an error but it really is.
> >
> > The direct output of the DDS is the easiest MSA source to beat with
> > WWV, since it's error will never be greater than .014 Hz.
> >
> > Actually, the Master Clock could be measured by a freq counter, but
> > freq counters have error too.
> > WWV has no frequency error. (Doppler enthusiasts, leave me alone).
> > Scotty
> >

> > --- On *Sun, 9/18/11, Steve /<steve65@...>/* wrote:
> >
> >
> > From: Steve <steve65@...>
> > Subject: [spectrumanalyzer] Setting master oscillator frequency
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Sunday, September 18, 2011, 5:31 PM
> >
> > Scotty,
> >
> > The Initial Set-Up and Calibrationfor the MSA
> > <http://www.scottyspectrumanalyzer.com/msasetcal.html> web page
> > describes two beat frequency methods for establishing the master
> > oscillator frequency.
> >
> > As an alternative, can the MO frequency be determined by
> > commanding the
> > tracking generator to 64MHz and reading its output on a frequency
> > counter? That reading can then be entered into the Mast Clock
> > field on
> > the Configuration Manager window?
> >
> > Thanks.
> >
> > Steve K8JQ
> >
> > --
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> >
> >
> >
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> --
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>

8501. Re: [spectrumanalyzer] Setting master oscillator frequency

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-19 14:22:18 UTC
From: william sprowls
Topic: 8493 Message: 8501

Hi All,
Perhaps I may have been a bit blunt in my answer (below). If you measure the frequency of the TG output with a frequency counter, your data will contain two errors:
The "round-off" bit error of the DDS 3 and the error of the frequency counter used. As I stated, the DDS error will be small, less than +/- 2 Hz.
  Also, the error of the freq counter is composed of two errors. The error of its reference and the "least significant bit" error in its counting process. For a freq counter that uses GPS as a source (assume 0 error), the only error is its LSB error. If the counter's resolution is 1 Hz, then 1 Hz will be its LSB error. But, how many of us have GPS "steered" frequency counters? This is why I developed the calibration procedure using WWV.
  The bottom line is, the accuracy of the Master Oscillator Calibration is dependent on the Reference source (WWV or Freq Counter).
  That being said, it is not often that a Spectrum Analyzer is required to have significant frequency accuracy. However, the MSA isn't just an SA. One Function of the MSA really does require frequency accuracy, the Crystal Test Function.
  Even though you may have not connectorized the "spare" port on the DDS 1, its signal is still there on the pad (hole) at J3.
  Once the Master Oscillator is calibrated, we must contend with frequency error due to temperature drift. Although this error is small I am planning an addition to the MSA hardware and software to allow temperature monitoring of the Master Oscillator module. Once calibrated for temp changes, this function will constantly update the actual frequency of the Master Oscillator while the program is running.
Scotty

--- On Sun, 9/18/11, william sprowls <wsprowls@...> wrote:

From: william sprowls <wsprowls@yahoo.com>
Subject: Re: [spectrumanalyzer] Setting master oscillator frequency
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, September 18, 2011, 8:26 PM

Hi Steve,
 Good question. But, no, the TG can be significantly off its command frequency (+/- 1.3 Hz). This is due to the fact that the DDS is always "rounded off" to its least significant bit. This is an error of only .014 Hz at 10.7 MHz (the DDS output). However, since the 10.7 gets multiplied up to the PLO operating frequency by a factor of 95 or more, so does the error. (95 x .014 Hz = 1.33 Hz). This doesn't sound like much of an error but it really is.

The direct output of the DDS is the easiest MSA source to beat with WWV, since it's error will never be greater than .014 Hz.

Actually, the Master Clock could be measured by a freq counter, but freq counters have error too.
 WWV has no frequency error. (Doppler enthusiasts, leave me alone).
Scotty

--- On Sun, 9/18/11, Steve <steve65@...>
wrote:

From: Steve <steve65@...>
Subject: [spectrumanalyzer] Setting master oscillator frequency
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, September 18, 2011, 5:31 PM

Scotty,

The Initial Set-Up and Calibrationfor the MSA

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describes two beat frequency methods for establishing the master

oscillator frequency.

As an alternative, can the MO frequency be determined by commanding the

tracking generator to 64MHz and reading its output on a frequency

counter? That reading can then be entered into the Mast Clock field on

the Configuration Manager window?

Thanks.

Steve K8JQ

--

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8502. PLL1 Configuration problem

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-20 13:56:59 UTC
From: Jurgen
Topic: 8502 Message: 8502

I have a PLL configuration manager problem.

I am using the ADF4113 for PLL1 and the 2326 for PLL2.
When I select 4112 for PLL1 in the configuration manager it will not stay.
It always returns to 2326.

Any ideas what is going on.

Thanks, Jurgen

8503. Re: PLL1 Configuration problem

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-20 14:54:37 UTC
From: Sam
Topic: 8502 Message: 8503

Jurgen,
What version are you using? If you use the current beta, that should not happen.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> I have a PLL configuration manager problem.
>
> I am using the ADF4113 for PLL1 and the 2326 for PLL2.
> When I select 4112 for PLL1 in the configuration manager it will not stay.
> It always returns to 2326.
>
> Any ideas what is going on.
>
> Thanks, Jurgen
>

8504. Re: [spectrumanalyzer] Re: PLL1 Configuration problem

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-20 15:46:26 UTC
From: Jurgen
Topic: 8502 Message: 8504

Sam,

The version is 115, RevG

Jurgen

On 9/20/2011 10:54 AM, Sam wrote:
>
> Jurgen,
> What version are you using? If you use the current beta, that should
> not happen.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@...> wrote:
> >
> > I have a PLL configuration manager problem.
> >
> > I am using the ADF4113 for PLL1 and the 2326 for PLL2.
> > When I select 4112 for PLL1 in the configuration manager it will not
> stay.
> > It always returns to 2326.
> >
> > Any ideas what is going on.
> >
> > Thanks, Jurgen
> >
>
>

8505. Re: [spectrumanalyzer] Re: PLL1 Configuration problem

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-20 16:42:21 UTC
From: william sprowls
Topic: 8502 Message: 8505

Hi Jurgen,
Use Version 116-4L Beta, in our Yahoo Group Files section.
Scotty

--- On Tue, 9/20/11, Jurgen <khj221@...> wrote:

From: Jurgen <khj221@...>
Subject: Re: [spectrumanalyzer] Re: PLL1 Configuration problem
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, September 20, 2011, 10:46 AM

Sam,

The version is 115, RevG

Jurgen

On 9/20/2011 10:54 AM, Sam wrote:

Jurgen,

What version are you using? If you use the current beta,
that should not happen.

Sam W.

--- In spectrumanalyzer@yahoogroups.com,
Jurgen <khj221@...> wrote:

>

> I have a PLL configuration manager problem.

>

> I am using the ADF4113 for PLL1 and the 2326 for
PLL2.

> When I select 4112 for PLL1 in the configuration
manager it will not stay.

> It always returns to 2326.

>

> Any ideas what is going on.

>

> Thanks, Jurgen

>

8506. Re: [spectrumanalyzer] Re: PLL1 Configuration problem

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-20 22:18:57 UTC
From: Jurgen
Topic: 8502 Message: 8506

Thanks, that seems to work better.
Jurgen

On 9/20/2011 12:42 PM, william sprowls wrote:
>
> Hi Jurgen,
> Use Version 116-4L Beta, in our Yahoo Group Files section.
> Scotty
>
> --- On *Tue, 9/20/11, Jurgen /<khj221@...>/* wrote:
>
>
> From: Jurgen <khj221@...>
> Subject: Re: [spectrumanalyzer] Re: PLL1 Configuration problem
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, September 20, 2011, 10:46 AM
>
> Sam,
>
> The version is 115, RevG
>
> Jurgen
>
>
>
> On 9/20/2011 10:54 AM, Sam wrote:
>
>> Jurgen,
>> What version are you using? If you use the current beta, that
>> should not happen.
>> Sam W.
>>
>> --- In spectrumanalyzer@yahoogroups.com
>> </mc/compose?to=spectrumanalyzer%40yahoogroups.com>, Jurgen
>> <khj221@...> </mc/compose?to=khj221@...> wrote:
>> >
>> > I have a PLL configuration manager problem.
>> >
>> > I am using the ADF4113 for PLL1 and the 2326 for PLL2.
>> > When I select 4112 for PLL1 in the configuration manager it
>> will not stay.
>> > It always returns to 2326.
>> >
>> > Any ideas what is going on.
>> >

>> > Thanks, Jurgen
>> >
>>
>

8507. Re: [spectrumanalyzer] PLO 1 Debugging Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-21 19:40:04 UTC
From: Eric Nystrom
Topic: 8476 Message: 8507

I added a second 10 uf cap at C20, C21, C24, and C25 on the Control board
and an additional 10 uf at C46 on PLO1 and PLO3.

I found that shielding was necessary to clean up the output of PLO3

The screen shots after the fix can be found at

http://groups.yahoo.com/group/spectrumanalyzer/files/Eric%20W4EON

Eric Nystrom

8508. Re: PLO 1 Debugging Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-21 21:49:00 UTC
From: Sam
Topic: 8476 Message: 8508

Eric,
Looks good. When you say you had to shield PLO3, was that just the normal shield around the board (with cover), or did you do extra shielding?
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> I added a second 10 uf cap at C20, C21, C24, and C25 on the Control board
> and an additional 10 uf at C46 on PLO1 and PLO3.
>
> I found that shielding was necessary to clean up the output of PLO3
>
>
> The screen shots after the fix can be found at
>
> http://groups.yahoo.com/group/spectrumanalyzer/files/Eric%20W4EON
>
> Eric Nystrom
>

8509. Re: [spectrumanalyzer] Re: PLO 1 Debugging Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-21 22:27:40 UTC
From: Eric Nystrom
Topic: 8476 Message: 8509

Sam,

It was the normal shielding. I had the MSA sitting on the bench and I found just picking it up from the bench was enough to clean up the signal. I guess the bench surface was reflecting the signal to PLO3. Since things seem to be working I went ahead and attached the shields. The shielding method I came up with is removable so if I need to access the board for any reason it is not trouble.

Eric Nystrom

From: Sam <swetterlin@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Wednesday, September 21, 2011 5:49 PM
Subject: [spectrumanalyzer] Re: PLO 1 Debugging Update

Eric,
Looks good. When you say you had to shield PLO3, was that just the normal shield around the board (with cover), or did you do extra shielding?
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> I added a second 10 uf cap at C20, C21, C24, and C25 on the Control board
> and an additional 10 uf at C46 on PLO1 and PLO3.
>
> I found that shielding was necessary to clean up the output of PLO3
>
>
> The screen shots after the fix can be found at
>
> http://groups.yahoo.com/group/spectrumanalyzer/files/Eric%20W4EON
>
> Eric Nystrom
>

8510. Re: [spectrumanalyzer] PLO 1 Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-22 23:48:51 UTC
From: Jurgen
Topic: 8476 Message: 8510

Hello Eric,

What kind of filter are you using?

Thanks, Jurgen

On 9/17/2011 2:54 PM, Eric Nystrom wrote:
> I replaced the 4118 on the PLO and it now works. I had low output on
> J3 so I replace
> U8. Now the output from J2 and J3 are similar.
>
> I have uploaded some files to the following folder.
>
> http://groups.yahoo.com/group/spectrumanalyzer/files/Eric%20W4EON
>
> I was wondering if the wider area the is at roughly -60db on the photo
> labeled PLO 1 Power
> Test is correct or indicates the PLO is not locked correctly.
>
> I have also uploaded a file for the PLO 3 Power Test. Does it look
> correct?
>
> Thanks
> Eric Nystrom
> ---
> **
>
>

8511. Re: [spectrumanalyzer] PLO 1 Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-23 00:21:37 UTC
From: Eric Nystrom
Topic: 8476 Message: 8511

Jurgen,

I found one on Ebay.

http://www.ebay.com/itm/ws/eBayISAPI.dll?ViewItem&item=150546045545&ssPageName=STRK:MEWAX:IT
They are still available. Sam had done a writeup about how to use it some time ago that I found in the archives.

Eric Nystrom

From: Jurgen <khj221@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Thursday, September 22, 2011 7:48 PM
Subject: Re: [spectrumanalyzer] PLO 1 Debugging

Hello Eric,

What kind of filter are you using?

Thanks, Jurgen

On 9/17/2011 2:54 PM, Eric Nystrom wrote:

>I replaced the 4118 on the PLO and it now works. I had low output on J3 so I replace
>U8. Now the output from J2 and J3 are similar.
>
>
>I have uploaded some files to the following folder.
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>http://groups.yahoo.com/group/spectrumanalyzer/files/Eric%20W4EON
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>
>I was wondering if the wider area the is at roughly -60db on the photo labeled PLO 1 Power
>Test is correct or indicates the PLO is not locked correctly.
>
>
>I have also uploaded a file for the PLO 3 Power Test. Does it look correct?
>
>
>
>Thanks
>
>

>Eric Nystrom
>
>
>_____
>
>
>

8512. Re: PLO 1 Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-23 18:13:50 UTC
From: Sam
Topic: 8476 Message: 8512

I don't recall doing a 15 kHz NDK filter, but maybe I did. You seem to have an awful lot of ripple in the passband, suggesting that the impedance match is not quite right. What are you using? If the seller is correct about the 2k impedance, you should have a 47 pF shunt cap on each side, and 4.7 uH inductors leading from there to input/output. If your inductors are not toroids, you might have a Q problem.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> Jurgen,
>
> I found one on Ebay.
>
> http://www.ebay.com/itm/ws/eBayISAPI.dll?ViewItem&item=150546045545&ssPageName=STRK:MEWA
X:IT
> They are still available.Â Sam had done a writeup about how to use it some time ago that
I found in the archives.
>
> Â
> Eric Nystrom
>
>
> _____
> From: Jurgen <khj221@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Thursday, September 22, 2011 7:48 PM
> Subject: Re: [spectrumanalyzer] PLO 1 Debugging
>
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> >
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> >_____
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> >
> >
>

8513. Re: [spectrumanalyzer] Filter Ripple

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-23 18:37:09 UTC
From: Eric Nystrom
Topic: 8476 Message: 8513

Sam,

Thanks for the comments. I thought the ripple did look bad, but was debugging other things.

I used 33 pf plus a trimmer. I have not spend much time adjusting yet.
The inductors are 0805 inductors. I guess I need to make some small toroids instead and give that a try.

This is what I found in the archived emails

For narrower
filters, a simple way to get started is to buy a canned filter on eBay, such as this one:

<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=150546045545&ssPageName=STRK:MEWAX:IT>

eBay filters don't
always specify the terminating impedance, but this one does. The termination is specified as 2000 ohms, which you would match to 50 ohms with 4.7 uH inductors leading to the filter terminals and 47 pF capacitance shunt to ground from the terminals. To allow some tuning, use 33 pF capacitors and a small trimmer that goes to 25 pF or so. You don't need any equipment to tune it other than the MSA. Just install it as the RBW filter, and do a sweep with center=0 and span=0.02 MHz and you should get a nice graph of the top 50 dB or so of its response, which is all you need for tuning. Adjust the trimmers until the top of the response looks good.

For a PCB, you can
use a blank double-sided board. Drill holes for the terminals and for a few ground vias. Mount the filter on the bottom and solder its case to ground. Put the components on the top with a fence running across the middle of the filter to isolate the input and output. Solder a fence around the outside of the board and solder a lid on it to cover the components. (If the fence is soldered to both the top and bottom ground planes, you can skip the ground vias described above.) It is not critical to solder the lid to the isolation fence in the middle of the filter. Poke/drill/cut two holes in the lid so you can tune the trimmers. You can cover the holes later with copper tape (or tack on a piece of brass), though it doesn't seem to cause any harm to leave them open.

I forgot the SMA
connectors. Poke holes in the enclosing fence and solder the connectors to the fence with the center pin poking through the hole. A filter built with a similar approach is shown here:

<http://groups.yahoo.com/group/spectrumanalyzer/photos/album/271352628/pic/664919547/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>

Sam W.

Eric Nystrom

_____
From: Sam <swetterlin@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Friday, September 23, 2011 2:13 PM
Subject: [spectrumanalyzer] Re: PLO 1 Debugging

I don't recall doing a 15 kHz NDK filter, but maybe I did. You seem to have an awful lot of ripple in the passband, suggesting that the impedance match is not quite right. What are you using? If the seller is correct about the 2k impedance, you should have a 47 pF shunt cap on each side, and 4.7 uH inductors leading from there to input/output. If your inductors are not toroids, you might have a Q problem.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
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8514. A simple way to change the vertical display sensitivity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-23 19:55:04 UTC
From: Jurgen
Topic: 8514 Message: 8514

Hello,
Is there a simple way to change the vertical display axis sensitivity.
Thanks, Jurgen

8515. Re: [spectrumanalyzer] A simple way to change the vertical display sensitivity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-23 20:39:57 UTC
From: william sprowls
Topic: 8514 Message: 8515

Double click just on the outside of the axis and its window will open. Change the top and bottom references. For example, with 10 horizontal grids, make to top reference 10 db higher than the bottom reference. It will then be 1 dB per grid. You can use any values, but the Top must be greater (in dB) than the Bottom. (Top = -15, Bot = -25)
Scotty

--- On Fri, 9/23/11, Jurgen <khj221@...> wrote:

From: Jurgen <khj221@...>
Subject: [spectrumanalyzer] A simple way to change the vertical display sensitivity
To: spectrumanalyzer@yahoogroups.com
Date: Friday, September 23, 2011, 2:55 PM

Hello,

Is there a simple way to change the vertical display axis sensitivity.

Thanks, Jurgen

8516. Re: [spectrumanalyzer] Filter Ripple

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-23 21:23:19 UTC
From: Eric Nystrom
Topic: 8476 Message: 8516

Sam,

The inductor I used in the matching network is a

http://search.digikey.com/scripts/DkSearch/dksus.dll?Detail&name=445-1055-1-ND

It has a Q of 45 at 10 MHz. Is that reasonable?

I don't have the fence in the module either. I will try that and also try adjusting the trimmers
to see if that will improve things any.

Eric Nystrom

From: Eric Nystrom <gloimon@...>
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Sent: Friday, September 23, 2011 2:37 PM
Subject: Re: [spectrumanalyzer] Filter Ripple

Sam,

Thanks for the comments. I thought the ripple did look bad, but was debugging other things.

I used 33 pf plus a trimmer. I have not spend much time adjusting yet.
The inductors are 0805 inductors. I guess I need to make some small toroids instead and give that a try.

This is what I found in the archived emails

For narrower
filters, a simple way to get started is to buy a canned filter on eBay, such as
this one:

<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=150546045545&ssPageName=STRK:MEWAX:IT>

eBay filters don't
always specify the terminating impedance, but this one does. The termination is
specified as 2000 ohms, which you would match to 50 ohms with 4.7 uH inductors
leading to the filter terminals and 47 pF capacitance shunt to ground from the
terminals. To allow some tuning, use 33 pF capacitors and a small trimmer that
goes to 25 pF or so. You don't need any equipment to tune it other than the
MSA. Just install it as the RBW filter, and do a sweep with center=0 and
span=0.02 MHz and you should get a nice graph of the top 50 dB or so of its
response, which is all you need for tuning. Adjust the trimmers until the top
of the response looks good.

For a PCB, you can
use a blank double-sided board. Drill holes for the terminals and for a few
ground vias. Mount the filter on the bottom and solder its case to ground. Put
the components on the top with a fence running across the middle of the filter
to isolate the input and output. Solder a fence around the outside of the board
and solder a lid on it to cover the components. (If the fence is soldered to
both the top and bottom ground planes, you can skip the ground vias described
above.) It is not critical to solder the lid to the isolation fence in the
middle of the filter. Poke/drill/cut two holes in the lid so you can tune the
trimmers. You can cover the holes later with copper tape (or tack on a piece of
brass), though it doesn't seem to cause any harm to leave them open.

I forgot the SMA
connectors. Poke holes in the enclosing fence and solder the connectors to the
fence with the center pin poking through the hole. A filter built with a
similar approach is shown here:

<http://groups.yahoo.com/group/spectrumanalyzer/photos/album/271352628/pic/664919547/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>

Sam W.

Eric Nystrom

_____
From: Sam <swetterlin@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Friday, September 23, 2011 2:13 PM
Subject: [spectrumanalyzer] Re: PLO 1 Debugging

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ripple in the passband, suggesting that the impedance match is not quite right. What are
you using? If the seller is correct about the 2k impedance, you should have a 47 pF shunt
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> Subject: Re: [spectrumanalyzer] PLO 1 Debugging
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>

8517. Re: Filter Ripple

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-23 23:46:31 UTC
From: Sam
Topic: 8476 Message: 8517

That Q value is great, and as it turns out it was measured at almost exactly our frequency. Fencing shouldn't affect the pass band response, just the far-out attenuation. As I recall, I always found that the proper capacitance was somewhat below the theoretical. It may also be that the filter impedance is not what the seller believes.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> Sam,
>
> The inductor I used in the matching network is a
>
> http://search.digikey.com/scripts/DkSearch/dksus.dll?Detail&name=445-1055-1-ND
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> It has a Q of 45 at 10 MHz.Â Is that reasonable?
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> From: Eric Nystrom <gloimon@...>
> To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
> Sent: Friday, September 23, 2011 2:37 PM
> Subject: Re: [spectrumanalyzer] Filter Ripple
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> I used 33 pf plus a trimmer.Â I have not spend much time adjusting yet.
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> Eric Nystrom
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> To: spectrumanalyzer@yahoogroups.com
> Sent: Friday, September 23, 2011 2:13 PM
> Subject: [spectrumanalyzer] Re: PLO 1 Debugging
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> > Sent: Thursday, September 22, 2011 7:48 PM
> > Subject: Re: [spectrumanalyzer] PLO 1 Debugging
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8518. Re: [spectrumanalyzer] A simple way to change the vertical display sensitivity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-24 09:59:20 UTC
From: Jurgen
Topic: 8514 Message: 8518

Thank you, Jurgen

On 9/23/2011 4:39 PM, william sprowls wrote:
>
> Double click just on the outside of the axis and its window will open.
> Change the top and bottom references. For example, with 10 horizontal
> grids, make to top reference 10 db higher than the bottom reference.
> It will then be 1 dB per grid. You can use any values, but the Top
> must be greater (in dB) than the Bottom. (Top = -15, Bot = -25)
> Scotty
>
> --- On *Fri, 9/23/11, Jurgen /<khj221@...>/* wrote:
>
>
> From: Jurgen <khj221@...>
> Subject: [spectrumanalyzer] A simple way to change the vertical
> display sensitivity
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, September 23, 2011, 2:55 PM
>
> Hello,
> Is there a simple way to change the vertical display axis sensitivity.
> Thanks, Jurgen
>
>

8519. Re: [spectrumanalyzer] A simple way to change the vertical display sensitivity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-24 13:03:53 UTC
From: Jurgen
Topic: 8514 Message: 8519

Scotty,
I did not explain myself properly.
What I am looking for is to change the vertical sensitivity. Right now the displayed 10dB increment equals about 14dB actual level change. I am looking for a simple way to modify this value without having to go through a calibration.
I am not ready for final system calibration since I don't have all the modules ready but would like to change the vertical axis gain for reference purposes.

Thank you, Jurgen

On 9/23/2011 4:39 PM, william sprowls wrote:
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> Double click just on the outside of the axis and its window will open.
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> From: Jurgen <khj221@...>
> Subject: [spectrumanalyzer] A simple way to change the vertical
> display sensitivity
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, September 23, 2011, 2:55 PM
>
> Hello,
> Is there a simple way to change the vertical display axis sensitivity.
> Thanks, Jurgen
>
>

8520. Re: A simple way to change the vertical display sensitivity

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-24 13:29:13 UTC
From: Sam
Topic: 8514 Message: 8520

Jurgen,
If you don't want to do the calibration procedure yet, you can just enter two signals whose strength you know approximately and look at Show Variables to see what ADC reading they produce. Then manually enter those in the calibration file for the path you are using, in place of the default values. You put the weaker signal on one line and the stronger one on the next line, with the ADC reading first and the dBm value second. That will at least give you decent readings between those values. If the two signals are close in strength, you can manually extrapolate to what the readings would be at, say, 0 dBm and -100 dBm, and enter those values in the file.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> Scotty,
> I did not explain myself properly.
> What I am looking for is to change the vertical sensitivity. Right now
> the displayed 10dB increment equals about 14dB actual level change. I am
> looking for a simple way to modify this value without having to go
> through a calibration.
> I am not ready for final system calibration since I don't have all the
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> reference purposes.
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> Thank you, Jurgen
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> > To: spectrumanalyzer@yahoogroups.com
> > Date: Friday, September 23, 2011, 2:55 PM
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>

8521. Cavity filter coupling loop location

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-26 19:32:29 UTC
From: jghbeta
Topic: 8521 Message: 8521

The coupling loop entry point ois specified at 70 mils from the bottom. How is this dimension arrived at and how does it affect filter behaviour? How critical is it?
The resonators are described as having 85 ohms impedance in general agreement with WB8GXB's indication. Shouldn't we try to get as close as 50 ohms to match with the mixers?

Jim W1JGH
.

8522. Re: Cavity filter coupling loop location

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-26 20:02:22 UTC
From: Sam
Topic: 8521 Message: 8522

The area enclosed by the coupling loops determines the amount of magnetic coupling, so if you make it longer you get more coupling, unless you also make it tighter to the wall.

Too much coupling gives a broadened response; way too much can actually create a dip in the middle. Too little gives a fairly sharp response, but with too much insertion loss. If you could view the change in response as you go from low coupling to high, you would see the profile move upward without changing shape, then start to become broader and flatter at the top without the top actually moving upward any more, as though it hit an invisible ceiling.

I suspect that there is more error caused by the loop bending away from the wall than from the loop being the wrong length.

75-85 ohms seems to be the sweet spot for minimizing loss in a cavity. (I believe that is also the reason TV cable is 75 ohms rather than 50.) The actual impedance seen from outside depends on the amount of coupling, so it can be near 50 ohms even if the cavity itself is 85 ohms.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> The coupling loop entry point ois specified at 70 mils from the bottom. How is this dimension arrived at and how does it affect filter behaviour? How critical is it?
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> Jim W1JGH
> .
>

8523. Schematics

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-27 16:29:47 UTC
From: kb9jzy
Topic: 8523 Message: 8523

Hello Everyone,
I am interested in this project as it has some (actually a LOT!) features that cost more than my car!

Where can I find schematics, parts lists etc?
Is there a central repository for this information?

I do appreciate everyones help and support.

Tnx,

Terry K9HA

8524. Re: Schematics

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-27 19:04:18 UTC
From: Sam
Topic: 8523 Message: 8524

Scotty's web site (in Links section) has all the schematics and info. In the Files section there is a document called MSA Overview that should help get you oriented.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "kb9jzy" <kb9jzy@...> wrote:
>
> Hello Everyone,
> I am interested in this project as it has some (actually a LOT!) features that cost more than my car!
>
> Where can I find schematics, parts lists etc?
> Is there a central repository for this information?
>
> I do appreciate everyones help and support.
>
> Tnx,
>
> Terry K9HA
>

8525. Re: [spectrumanalyzer] Cavity filter coupling loop location

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-27 20:29:28 UTC
From: Jim Hontoria
Topic: 8521 Message: 8525

ent'o

Jim G. Hontoria ppop

Sent from my iPhone

On Sep 26, 2011, at 3:32 PM, "jghbeta" <jghalpha@...> wrote:

> The coupling loop entry point ois specified at 70 mils from the bottom. How is this dimension arrived at and how does it affect filter behaviour? How critical is it?
> The resonators are described as having 85 ohms impedance in general agreement with WB8GXB's indication. Shouldn't we try to get as close as 50 ohms to match with the mixers?
>
> Jim W1JGH
> .
>
>

8526. Mixer Tests and PDM Test

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-28 17:52:33 UTC
From: Eric Nystrom
Topic: 8526 Message: 8526

I have added some photos to the following album showing the results of my mixer tests and PDM test.

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/80349892/pic/list

The input to the mixers is in the following files:

Master Osc output level
DDS 1 output after filter

The outputs of the mixers are in

Mixer x test

I have read through the test procedure and my interpretation is the conversion loss on the mixers is outside of the expected limit. I hope I have posted enough info to tell if this is the correct interpretation.

I have also posted a photo showing the results of the PDM test. It appears the output level is low based upon what is stated in the test procedure. I was wondering if the phase plot is reasonable? On port 2 of the control module bits 6 and 7 are bad. I did not want to wait to get a new chip so I moved the PDM control line to bit 5. I think I found all the places.

Thanks,

Eric Nystrom

8527. Re: Schematics

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-28 21:03:58 UTC
From: kb9jzy
Topic: 8523 Message: 8527

Thank you Sam.

I will have time in the next day or 2 to look it over.

I'm sure I'll have more questions.....

Terry K9HA

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Scotty's web site (in Links section) has all the schematics and info. In the Files section there is a document called MSA Overview that should help get you oriented.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "kb9jzy" <kb9jzy@> wrote:
> >
> > Hello Everyone,
> > I am interested in this project as it has some (actually a LOT!) features that cost more than my car!
> >
> > Where can I find schematics, parts lists etc?
> > Is there a central repository for this information?
> >
> > I do appreciate everyones help and support.
> >
> > Tnx,
> >
> > Terry K9HA
> >
>

8528. Re: [spectrumanalyzer] Mixer Tests and PDM Test

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-28 23:44:08 UTC
From: william sprowls
Topic: 8526 Message: 8528

Hi Eric,
 I believe you stated in an earlier post that you have not calibrated yet. If this is still true, don't take your conversion loss results too seriously. Also, you should use much lower input power to a mixer. An input level of greater than 0 dBm will likely cause the mixer to compress. I like around -10 to -20 dBm as an input level.
 Your picture showing phase vs frequency is inverted. Perhaps you have accidentally swapped the two inputs to the PDM.
Scotty

--- On Wed, 9/28/11, Eric Nystrom <gloimon@yahoo.com> wrote:

From: Eric Nystrom <gloimon@...>
Subject: [spectrumanalyzer] Mixer Tests and PDM Test
To: "Spectrum Analyzer" <spectrumanalyzer@yahoogroups.com>
Date: Wednesday, September 28, 2011, 12:52 PM

I have added some photos to the following album showing the results ofmy mixer tests and PDM test.
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/80349892/pic/list
The input to the mixers is in the following files:

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phase plot is reasonable? On port 2 of the control module bits 6 and 7 are bad. I did not want to wait to get a new chip so I moved the PDM control line to bit 5. I think I found all the places.

Thanks,

Eric Nystrom

8529. Re: [spectrumanalyzer] Mixer Tests and PDM Test

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-29 00:59:10 UTC
From: Eric Nystrom
Topic: 8526 Message: 8529

Scotty,

Thanks for your comments.

For the mixer tests, is the coarse calibration outlined in the DDS test adequate to get reasonable
results? I did this calibration, but will double check it and retest the mixers.

On the levels to the mixer the test procedure shows connecting the Master Oscillator directly to the L port
through a DC block. This would put about 9.5 - 2.5 = 7 db to the L port. The ADE-11X+ data sheet shows
roughly this level on the plot for the L port.

The DDS 1 filter output is about -12 db which is what you used in the test procedure example.

Does this seem correct.

One thing I noticed was the output levels that I measured in the PLO power tests were consistent with
your examples in the test procedure while the mixer tests came out low.

On the inversion of the phase vs frequency I found the trouble. I rearranged the layout and built it according
to the diagram on this page

http://www.scottyspectrumanalyzer.com/msaslim.html#Block_Diagram_of_SLIM_MSA

I compared that to cable drawing on this page

http://www.scottyspectrumanalyzer.com/msaslim.html#Layout_of_the_MSA

and it appears that J1 and J2 are swapped on the Block diagram compared to the Layout drawing.

Eric Nystrom

From: william sprowls <wsprowls@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Wednesday, September 28, 2011 7:44 PM
Subject: Re: [spectrumanalyzer] Mixer Tests and PDM Test

Hi Eric,
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>not want to wait to get a new chip so I moved the PDM control line to bit 5. I think I
>found all the places.
>
>Thanks,
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>
>Eric Nystrom

8530. Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-29 22:18:19 UTC
From: Eric Nystrom
Topic: 11 Message: 8530

Sorry for more questions.

I started testing my cavity filter and it seems to work, but there is an extra peak in the plot
about 15 db below the main peak and about 3 Mhz above the main peak that does not move
when I adjust the tuning screws. Only a rough calibration has been done, but the insertion loss
appears to be about 10db. The top is currently held in place with rubber bands. I wanted to
keep my options open for adjusting the wires if necessary.

I have included views of VNA mode, TG mode, and theinput signal plot.

Any ideas as to the cause of the extra peak? Would soldering the top help? Or should I try again.

Eric Nystrom

8531. Re: [spectrumanalyzer] Mixer Tests and PDM Test

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-29 22:21:37 UTC
From: william sprowls
Topic: 8526 Message: 8531

Hi Eric,
 For the Mixer tests you do not use the DDS 1 filter output (J4). You use the "Spare" output (J3). It's output level should be about -8 dBm. It passes through the Final Crystal Filter and depending on its insertion loss, a total of -12 dBm entering the Mixer J2 port is reasonable.
Course calibration should give results that have less than a 10% error.
 I would not be concerned if the Mixer conversion loss is 8dB or less. If all 4 Mixers show the same results of excess conversion loss, the LO power may be lower than expected (Mixer J1).

The Block Diagram is correct. The "Proposed Layout" is not. It was not meant to be a guide for connecting specific I/O's.
Scotty

--- On Wed, 9/28/11, Eric Nystrom <gloimon@...> wrote:

From: Eric Nystrom <gloimon@...>
Subject: Re: [spectrumanalyzer] Mixer Tests and PDM Test
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Wednesday, September 28, 2011, 7:59 PM

Scotty,
Thanks for your comments.

For the mixer tests, is the coarse calibration outlined in the DDS test adequate to get reasonableresults? I did this calibration, but will double check it and retest the mixers.

On the levels to the mixer the test procedure shows connecting the Master Oscillator directly to the L portthrough a DC block. This would put about 9.5 - 2.5 = 7 db to the L port. The ADE-11X+ data sheet showsroughly this level on the plot for the L port.

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swapped on the Block diagram compared to the Layout drawing. Eric Nystrom
From: william sprowls <wsprowls@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Wednesday, September 28, 2011 7:44 PM

Subject: Re: [spectrumanalyzer] Mixer Tests and PDM Test

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 Your picture showing phase vs frequency is inverted. Perhaps you have accidentally swapped the two inputs to the PDM.
Scotty

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To: "Spectrum Analyzer" <spectrumanalyzer@yahoogroups.com>
Date: Wednesday,
September 28, 2011, 12:52 PM

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Mixer x test

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I have also posted a photo showing the results of the PDM test. It appears the output level is low based upon what is stated in the test procedure. I was wondering if the
phase plot is reasonable? On port 2 of the control module bits 6 and 7 are bad. I did not want to wait to get a new chip so I moved the PDM control line to bit 5. I think I found all the places.

Thanks,

Eric Nystrom

8532. Re: [spectrumanalyzer] Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-29 22:27:44 UTC
From: william sprowls
Topic: 11 Message: 8532

Hi Eric,
 Good screen captures, showing a problem with the cavity filter. If that peak does not move when tuning the screws, there is a mechanical problem. Perhaps a bad solder joint on on of the hair pins. Perhaps one of the tuning screws is touching its center stub.
Scotty

--- On Thu, 9/29/11, Eric Nystrom <gloimon@...> wrote:

From: Eric Nystrom <gloimon@yahoo.com>
Subject: [spectrumanalyzer] Cavity Filter
To: "Spectrum Analyzer" <spectrumanalyzer@yahoogroups.com>
Date: Thursday, September 29, 2011, 5:18 PM

Sorry for more questions.
I started testing my cavity filter and it seems to work, but there is an extra peak in the plotabout 15 db below the main peak and about 3 Mhz above the main peak that does not movewhen I adjust the tuning screws. Only a rough calibration has been done, but the insertion lossappears to be about 10db. The top is currently held in place with rubber bands. I wanted
tokeep my options open for adjusting the wires if necessary.

I have included views of VNA
mode, TG mode, and the input signal plot.

Any ideas as to the cause of the extra peak? Would soldering the top help? Or should Itry again.
Eric Nystrom

8533. Re: Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-29 22:48:26 UTC
From: Sam
Topic: 11 Message: 8533

That peak at +3MHz looks like what you get with one of the four cavities out of tune, and you should be able to slide it downward by moving its screw inward. You also have a broad but small bump at about -4MHz that I would guess is another cavity out of tune. The lack of response when turning screws is odd. If the screws extend into the cavity, any change should have some visible effect unless the peak corresponding to the cavity being tuned is "off-screen". Be sure the screws are reasonably aligned with the ends of the resonator rods. Soldering is necessary for stability, but it should be possible with rubber bands to get basic functionality.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> Sorry for more questions.
>
>
> I started testing my cavity filter and it seems to work, but there is an extra peak in the plot
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> Any ideas as to the cause of the extra peak? Would soldering the top help? Or should I
> try again.
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> Eric Nystrom
>

8534. Re: [spectrumanalyzer] Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-29 23:14:54 UTC
From: Eric Nystrom
Topic: 11 Message: 8534

Scotty,

It was a bad solder joint on one of the hair pins. I fluxed, reheated and added some more solder
and I get the following results in TG Mode and VNA Mode. That was after a quick tune.

Thanks for the help.

Eric Nystrom

From: william sprowls <wsprowls@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Thursday, September 29, 2011 6:27 PM
Subject: Re: [spectrumanalyzer] Cavity Filter

Hi Eric,
 Good screen captures, showing a problem with the cavity filter. If that peak does not move when tuning the screws, there is a mechanical problem. Perhaps a bad solder joint on on of the hair pins. Perhaps one of the tuning screws is touching its center stub.
Scotty

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>Any ideas as to the cause of the extra peak? Would soldering the top help? Or should I
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>Eric Nystrom
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8535. Re: [spectrumanalyzer] Mixer Tests and PDM Test

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-29 23:28:43 UTC
From: Eric Nystrom
Topic: 8526 Message: 8535

Scotty,

I am using the spare output of DDS1. My trace showed the output of DDS spare after the 10.7
MHz Filter. I have about -11 db going in to Mixer 2 and -21 db coming out. All the mixers appear low by about the same amount.

I have added a photo showing the PDM connections the way it is currently. I swapped it since
the previous trace. The Filter VNA trace shows how the phase currently looks. Does this look
correct now? Or was the inverted phase caused by something else possibly?

Thanks.

Eric Nystrom

From: william sprowls <wsprowls@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Thursday, September 29, 2011 6:21 PM
Subject: Re: [spectrumanalyzer] Mixer Tests and PDM Test

Hi Eric,
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Course calibration should give results that have less than a 10% error.
 I would not be concerned if the Mixer conversion loss is 8dB or less. If all 4 Mixers show the same results of excess conversion loss, the LO power may be lower than expected (Mixer J1).

The Block Diagram is correct. The "Proposed Layout" is not. It was not meant to be a guide for connecting specific I/O's.
Scotty

--- On Wed, 9/28/11, Eric Nystrom <gloimon@...> wrote:

>From: Eric Nystrom <gloimon@...>
>Subject: Re: [spectrumanalyzer] Mixer Tests and PDM Test
>To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
>Date: Wednesday, September 28, 2011, 7:59 PM
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>Eric Nystrom
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>
>_____
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>To: spectrumanalyzer@yahoogroups.com
>Sent: Wednesday, September 28, 2011 7:44 PM
>Subject: Re: [spectrumanalyzer] Mixer Tests and PDM Test
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>Hi Eric,
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>>found all the places.
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>>Thanks,
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>>Eric Nystrom
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>

8536. Re: [spectrumanalyzer] Mixer Tests and PDM Test

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-30 03:43:24 UTC
From: william sprowls
Topic: 8526 Message: 8536

Hi Eric,
 The phase slope is correct now.
I doubt if that high conversion loss is real. It is probably due to the "coarse" calibration.
Scotty

--- On Thu, 9/29/11, Eric Nystrom <gloimon@...> wrote:

From: Eric Nystrom <gloimon@...>
Subject: Re: [spectrumanalyzer] Mixer Tests and PDM Test
To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
Date: Thursday, September 29, 2011, 6:28 PM

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Eric Nystrom
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phase plot is reasonable? On port 2 of the control module bits 6 and 7 are bad. I did not want to wait to get a new chip so I moved the PDM control line to bit 5. I think I found all the places.

Thanks,

Eric Nystrom

8537. MSA filter plus PWB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-30 13:25:06 UTC
From: Steve
Topic: 8537 Message: 8537

A question regarding the MSA filter plus PWB from earlier this year.

There are four unlabeled, rectangular shaped PWBs included on the PWB. Each is about 3/8in X 1 1/8in in dimension. Each appears to to accommodate an SMA connector on each end. What are these four?

Thanks.

Steve K8JQ

--
Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

8538. Re: MSA filter plus PWB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-30 19:16:49 UTC
From: Sam
Topic: 8537 Message: 8538

I don't recall exactly, but those are either for attenuators, or if they have a straight through connection they are intended to have the trace cut wherever necessary to add components for whatever you want--such as a series capacitor for a DC block.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
>
> A question regarding the MSA filter plus PWB from earlier this year.
>
> There are four unlabeled, rectangular shaped PWBs included on the PWB.
> Each is about 3/8in X 1 1/8in in dimension. Each appears to to
> accommodate an SMA connector on each end. What are these four?
>
> Thanks.
>
> Steve K8JQ
>
> --
> Read The Onion
>

8539. A question about IF Amplifier Module versions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-30 19:50:54 UTC
From: Steve
Topic: 8539 Message: 8539

Scotty,

I have two SLIM IF amplifier PWB's which are marked REV B. The web page for that module has details regarding REV A, but I see nothing about REV B.

Is there information about REV B out there on the web somewhere? What did REV B do to the module?

Thanks.

Steve K8JQ

--
Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

8540. Re: [spectrumanalyzer] Re: MSA filter plus PWB

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-30 19:52:42 UTC
From: Steve
Topic: 8537 Message: 8540

Thanks Sam. Attenuators is kinda what they look to be. Wanted some confirmation :)

Steve K8JQ

On 9/30/2011 3:16 PM, Sam wrote:
> I don't recall exactly, but those are either for attenuators, or if they have a straight through connection they are intended to have the trace cut wherever necessary to add components for whatever you want--such as a series capacitor for a DC block.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Steve<steve65@...> wrote:
>> A question regarding the MSA filter plus PWB from earlier this year.
>>
>> There are four unlabeled, rectangular shaped PWBs included on the PWB.
>> Each is about 3/8in X 1 1/8in in dimension. Each appears to to
>> accommodate an SMA connector on each end. What are these four?
>>
>> Thanks.
>>
>> Steve K8JQ
>>
>> --
>> Read The Onion
>>
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> Yahoo! Groups Links
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Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

8541. Re: [spectrumanalyzer] A question about IF Amplifier Module versions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-09-30 23:34:54 UTC
From: william sprowls
Topic: 8539 Message: 8541

Hi Steve,
 The "official released" pwb on the web page is marked PWB-RFA Rev 0. Any other markings mean that someone has recreated the pwb and changed the nomenclature.
  The completed module would be "SLIM-IFA-33 Rev A". There is no Rev B.
Don't fret, just compare your pwb to the one on the web page. It is probably the same.
Scotty

--- On Fri, 9/30/11, Steve <steve65@...> wrote:

From: Steve <steve65@...>
Subject: [spectrumanalyzer] A question about IF Amplifier Module versions
To: spectrumanalyzer@yahoogroups.com
Date: Friday, September 30, 2011, 2:50 PM

Scotty,

I have two SLIM IF amplifier PWB's which are marked REV B. The web page

for that module has details regarding REV A, but I see nothing about REV B.

Is there information about REV B out there on the web somewhere? What

did REV B do to the module?

Thanks.

Steve K8JQ

--

Read The Patriot Post Vertitas vos Liberabit

http://patriotpost.us/subscription/

8542. Re: [spectrumanalyzer] A question about IF Amplifier Module versions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-03 03:23:52 UTC
From: Steve
Topic: 8539 Message: 8542

Scotty,

I got the quantity wrong in my first note -- I only have one of the REV B boards. It has silk screening and solder mask, I think the only MSA PWB's I have with those features came from Cash Olsen in 2008.

I did compare the REV B board with REV 0 and can find no differences on the trace/component side of the PWB. The bottom side has some solder mask that was evidently placed there as a place for silk screening to identify J1, J2, J3, J4 and P1. I believe the two boards are electrically identical.

Thanks for the advice.

Steve K8JQ

On 9/30/2011 7:34 PM, william sprowls wrote:
>
>
> Hi Steve,
> The "official released" pwb on the web page is marked PWB-RFA Rev 0.
> Any other markings mean that someone has recreated the pwb and changed
> the nomenclature.
> The completed module would be "SLIM-IFA-33 Rev A". There is no Rev B.
> Don't fret, just compare your pwb to the one on the web page. It is
> probably the same.
> Scotty
>
> --- On *Fri, 9/30/11, Steve /<steve65@...>/* wrote:
>
>
> From: Steve <steve65@...>
> Subject: [spectrumanalyzer] A question about IF Amplifier Module
> versions
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, September 30, 2011, 2:50 PM
>
> Scotty,
>
> I have two SLIM IF amplifier PWB's which are marked REV B. The web
> page
> for that module has details regarding REV A, but I see nothing
> about REV B.
>
> Is there information about REV B out there on the web somewhere? What
> did REV B do to the module?

>
> Thanks.
>
> Steve K8JQ
>
> --
> Read The Patriot Post Vertitas vos Liberabit
> http://patriotpost.us/subscription/
>
>
>
>

--
Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

8543. Hi newbie interested in MSA,How to begin??

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-04 03:50:56 UTC
From: ku637
Topic: 8543 Message: 8543

Hi,

I ve got a moderate experience in hardware design , mostly DC circuits & PCB layout tools like Altium & Allegro,And have done some multi layerd & impedance controlled RF boards myself.But not that much in big scale either..
Ive got some exposure to testing with spectrum analyser,VNA & some little RF circuits too in my work place, but those equipments are not accessible for personal purposes..

So im interested in building an MSA.

Can some one guide me how to begin.?I ve read in the web pages that its better to start with control board first...
At my home i ve nothing but a Digital Multimeter at my hand..How should i start working on this?

Thanks for any help :)
Stephen.

8544. Hi newbie interested in MSA,How to begin??

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-04 03:51:15 UTC
From: ku637
Topic: 8543 Message: 8544

Hi,

I ve got a moderate experience in hardware design , mostly DC circuits & PCB layout tools like Altium & Allegro,And have done some multi layerd & impedance controlled RF boards myself.But not that much in big scale either..
Ive got some exposure to testing with spectrum analyser,VNA & some little RF circuits too in my work place, but those equipments are not accessible for personal purposes..

So im interested in building an MSA.

Can some one guide me how to begin.?I ve read in the web pages that its better to start with control board first...
At my home i ve nothing but a Digital Multimeter at my hand..How should i start working on this?

Thanks for any help :)
Stephen.

8545. Re: Hi newbie interested in MSA,How to begin??

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-05 00:08:28 UTC
From: Sam
Topic: 8543 Message: 8545

See Message 8524 for starters.

As far as equipment, I strongly suggest you get an oscilloscope. Not only is it helpful in testing the MSA, but in general an oscilloscope has a much better cost/benefit ratio than a spectrum analyzer. Scotty will probably disagree with that statement.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "ku637" <steeve102000@...> wrote:
>
> Hi,
>
> I ve got a moderate experience in hardware design , mostly DC circuits & PCB layout tools like Altium & Allegro,And have done some multi layerd & impedance controlled RF boards myself.But not that much in big scale either..
> Ive got some exposure to testing with spectrum analyser,VNA & some little RF circuits too in my work place, but those equipments are not accessible for personal purposes..
>
> So im interested in building an MSA.
>
> Can some one guide me how to begin.?I ve read in the web pages that its better to start with control board first...
> At my home i ve nothing but a Digital Multimeter at my hand..How should i start working on this?
>
> Thanks for any help :)
> Stephen.
>

8546. Re: [spectrumanalyzer] Hi newbie interested in MSA,How to begin??

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-05 00:17:10 UTC
From: William Dillon
Topic: 8543 Message: 8546

I totally agree with Sam.

especially when totally adequate DSO's (Digital Storage Oscilloscope) have become as cheap as they are.

http://www.eevblog.com/2009/04/05/full-review-of-the-rigol-ds1052e/

- Will

On Oct 4, 2011, at 5:08 PM, Sam wrote:

> See Message 8524 for starters.
>
> As far as equipment, I strongly suggest you get an oscilloscope. Not only is it helpful in testing the MSA, but in general an oscilloscope has a much better cost/benefit ratio than a spectrum analyzer. Scotty will probably disagree with that statement.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "ku637" <steeve102000@...> wrote:
> >
> > Hi,
> >
> > I ve got a moderate experience in hardware design , mostly DC circuits & PCB layout tools like Altium & Allegro,And have done some multi layerd & impedance controlled RF boards myself.But not that much in big scale either..
> > Ive got some exposure to testing with spectrum analyser,VNA & some little RF circuits too in my work place, but those equipments are not accessible for personal purposes..
> >
> > So im interested in building an MSA.
> >
> > Can some one guide me how to begin.?I ve read in the web pages that its better to start with control board first...
> > At my home i ve nothing but a Digital Multimeter at my hand..How should i start working on this?
> >
> > Thanks for any help :)
> > Stephen.
> >
>
>

8547. Re: Hi newbie interested in MSA,How to begin??

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-05 16:52:39 UTC
From: redmond2@iinet.net.au
Topic: 8543 Message: 8547

My pennies worth.
I would first borrow/share/buy a crude basic $1K SA 1.3Ghz with TG and a $100 2GHz counter
My 400 MHz digital Tex scope?was mostly useless in the RF area.
Even a basic 20 MHz scope would have been?enough for the control part.

Regards
Len Spyker

8548. Re: [spectrumanalyzer] Re: Hi newbie interested in MSA,How to begin??

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-05 17:43:07 UTC
From: Robert Fish
Topic: 8543 Message: 8548

It is quite a conundrum. The perfect tool for building/testing an MSA is a calibrated MSA.
One of the building procedures that Scotty has on his website is laid out so you can
use previously built modules to check the new ones as you build them.
"Test as you build".

Here is the link:

http://scottyspectrumanalyzer.com/testingslim.html

A Volt-Ohm meter is required. An Oscilloscope is optional, but like Len said unless you have a
really fast one it is only really useful on the control side.

Have Fun,

Bob K6GGO

> My pennies worth.
> I would first borrow/share/buy a crude basic $1K SA 1.3Ghz with TG and
> a $100 2GHz counter
> My 400 MHz digital Tex scope was mostly useless in the RF area.
> Even a basic 20 MHz scope would have been enough for the control part.
>
> Regards
> Len Spyker
>
>
>
>
>

8549. Re: Hi newbie interested in MSA,How to begin??

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-05 18:47:45 UTC
From: Sam
Topic: 8543 Message: 8549

I have a 400 MHz Tektronix analog scope that came in very handy when building the MSA. It is useful for every module that operates at the IF frequency, or for looking at DDS outputs or the master oscillator. Obviously it does not help with the PLOs, though you can use it to look at the output of a mixer when the LO and RF are at nearby frequencies, even though they are >1 GHz. A 100 MHz scope would be almost as good, except for the MO.

You don't absolutely need a scope to build the MSA, but if you run into problems, nothing beats being able to look at actual waveforms.

If space is more of an issue than money, check out the Picoscope products, which are very nice and consist of a tiny box that interfaces with the computer.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Robert Fish <rwfish@...> wrote:
>
> It is quite a conundrum. The perfect tool for building/testing an MSA is
> a calibrated MSA.
> One of the building procedures that Scotty has on his website is laid
> out so you can
> use previously built modules to check the new ones as you build them.
> "Test as you build".
>
> Here is the link:
>
> http://scottyspectrumanalyzer.com/testingslim.html
>
> A Volt-Ohm meter is required. An Oscilloscope is optional, but like Len
> said unless you have a
> really fast one it is only really useful on the control side.
>
> Have Fun,
>
> Bob K6GGO
>
> > My pennies worth.
> > I would first borrow/share/buy a crude basic $1K SA 1.3Ghz with TG and
> > a $100 2GHz counter
> > My 400 MHz digital Tex scope was mostly useless in the RF area.
> > Even a basic 20 MHz scope would have been enough for the control part.
> >
> > Regards
> > Len Spyker
> >
> >
> >

> >
> >
>

8550. Re: [spectrumanalyzer] Re: Hi newbie interested in MSA,How to begin??

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-05 19:33:57 UTC
From: Al
Topic: 8543 Message: 8550

I have been considering a pico 3206 scope.

Does any one have experience with the 3206?
How well does the digital scope perform?
Also, Spectrum Analyzer?

I'm looking at it for 2meter(150MHz) measurements.
Is it suitable for testing the MO?

Al K.

Wed, 2011-10-05 at 18:47 +0000, Sam wrote:
>
> I have a 400 MHz Tektronix analog scope that came in very handy when
> building the MSA. It is useful for every module that operates at the
> IF frequency, or for looking at DDS outputs or the master oscillator.
> Obviously it does not help with the PLOs, though you can use it to
> look at the output of a mixer when the LO and RF are at nearby
> frequencies, even though they are >1 GHz. A 100 MHz scope would be
> almost as good, except for the MO.
>
> You don't absolutely need a scope to build the MSA, but if you run
> into problems, nothing beats being able to look at actual waveforms.
>
> If space is more of an issue than money, check out the Picoscope
> products, which are very nice and consist of a tiny box that
> interfaces with the computer.
>
> Sam W.
>

8551. Re: [spectrumanalyzer] Re: Hi newbie interested in MSA,How to begin??

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-05 20:00:58 UTC
From: Geoff Moore
Topic: 8543 Message: 8551

Other than using a basic multimeter to check supply voltages, I didn't have or use any other test equipment to get my MSA going.

If you are very careful in the building, it will work first time and most alignment can be done using the MSA itself.

I did have a problem with the phase detector which I think was down to a badly soldered joint on that very small IC. I did use a 60MHz dual beam scope to find that but it was an old basic scope. No fancy storage facilities.

Geoff

----- Original Message -----
From: Robert Fish
To: spectrumanalyzer@yahoogroups.com
Cc: steeve102000@yahoo.com
Sent: Wednesday, October 05, 2011 6:43 PM
Subject: Re: [spectrumanalyzer] Re: Hi newbie interested in MSA,How to begin??

It is quite a conundrum. The perfect tool for building/testing an MSA is a calibrated MSA. One of the building procedures that Scotty has on his website is laid out so you can use previously built modules to check the new ones as you build them. "Test as you build".

Here is the link:

http://scottyspectrumanalyzer.com/testingslim.html

A Volt-Ohm meter is required. An Oscilloscope is optional, but like Len said unless you have a
really fast one it is only really useful on the control side.

Have Fun,

Bob K6GGO

My pennies worth.
I would first borrow/share/buy a crude basic $1K SA 1.3Ghz with TG and a $100 2GHz counter
My 400 MHz digital Tex scope was mostly useless in the RF area.
Even a basic 20 MHz scope would have been enough for the control part.

Regards
Len Spyker

8552. Re: [spectrumanalyzer] Re: Hi newbie interested in MSA,How to begin??

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-06 00:15:51 UTC
From: Jim Hontoria
Topic: 8543 Message: 8552

Also take a look at the BitScope. I have owned one for years and I am very
happy with it.
Jim W1JGH

On Wed, Oct 5, 2011 at 3:33 PM, Al <aked101@wizardstor.com> wrote:

> **
>
>
> I have been considering a pico 3206 scope.
>
> Does any one have experience with the 3206?
> How well does the digital scope perform?
> Also, Spectrum Analyzer?
>
> I'm looking at it for 2meter(150MHz) measurements.
> Is it suitable for testing the MO?
>
> Al K.
>
>
> Wed, 2011-10-05 at 18:47 +0000, Sam wrote:
> >
> > I have a 400 MHz Tektronix analog scope that came in very handy when
> > building the MSA. It is useful for every module that operates at the
> > IF frequency, or for looking at DDS outputs or the master oscillator.
> > Obviously it does not help with the PLOs, though you can use it to
> > look at the output of a mixer when the LO and RF are at nearby
> > frequencies, even though they are >1 GHz. A 100 MHz scope would be
> > almost as good, except for the MO.
> >
> > You don't absolutely need a scope to build the MSA, but if you run
> > into problems, nothing beats being able to look at actual waveforms.
> >
> > If space is more of an issue than money, check out the Picoscope
> > products, which are very nice and consist of a tiny box that
> > interfaces with the computer.
> >
> > Sam W.
> >
>
>
>

--
Jim G. Hontoria

8553. Re: Hi newbie interested in MSA,How to begin??

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-06 11:57:11 UTC
From: Sam
Topic: 8543 Message: 8553

I have an older Pico scope, which functions well. The software is very good. However, a caveat on digital scopes: Aliasing causes signals whose frequency is more than half the sampling rate to appear on the screen, which means you need to filter out high frequencies. The fact that you can't make a brick wall filter means you could lose some of the high end of your bandwidth. However, the 3206 states a bandwidth of 200 MHz and sampling of 500 MS/s, so it might be feasible to make a filter that attenuates 250 MHz and above but does not affect 200 MHz very much; and maybe it even has a built-in filter. Plus, for repetitive signals the scope has an ETS mode that greatly increases the effective sampling rate. This scope should work fine at 150 MHz, though with a 200 MHz bandwidth it of course won't show harmonics, so it is useless for looking at distortion of a 150 MHz signal. It would work with the MO to show the basic functionality of the MO, but would not respond past the third harmonic and therefore won't show a true square wave--just a somewhat squashed sine wave.

The usefulness of the Picoscope 3206 as a spectrum analyzer is limited by its 8-bit resolution, though Pico claims it can achieve effective 12-bit resolution by making multiple measurements. I haven't tried that.

The real advantage of digital scopes is the ability to record data, which is especially handy for non-repetitive signals. For example, even for a simple operation like toggling the latch bits, the control board outputs have erratic spacing due to the computer's unpredictable time response. It's hard to get an analog scope to lock properly and show a consistent image, but a digital scope could just record a long sequence of the control board output. Of course, you would only be recording one bit at a time, but this might be useful for looking at glitches on the clock line.

For repetitive signals, like the MO, a DDS at a fixed frequency, or a 150 MHz oscillator, I much prefer an analog scope. If desired, you can "record" the data by taking a photo. My 400 MHz Tektronix (465? I can't recall) does a fine job and will easily measure a number of things like peak voltage, frequency, rise/fall time and time intervals. And if it encounters a signal of 500 MHz, it simply displays it as an attenuated signal rather than aliasing it to a lower frequency. I think it cost me $300-$400 years ago on eBay.

Another application of the scope: The MSA in reflection mode measures what sometimes seems like a mystical quantity called reflection coefficient. With a simple setup with a moderate bandwidth scope, you can actually see the reflections, which helps make them into something "real". See:
<http://www.wetterlin.org/sam/Reflection/VisibleReflections.pdf>

That document shows square wave reflections. Square waves are easy to interpret even with the reflection superimposed on the input signal; sine waves would be tougher. With a good reflection bridge and a dual-trace scope (like my Tektronix, though lower bandwidth may be fine), you could easily view a sine wave input signal on one trace and the reflection on the other. By comparing the amplitudes and phases, you could easily determine the reflection coefficient from the scope display--no VNA required. This should work quite well at any frequency within the bandwidth of the scope, with perhaps a practical upper limit of 100 MHz.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Al <aked101@...> wrote:
>
> I have been considering a pico 3206 scope.
>
> Does any one have experience with the 3206?
> How well does the digital scope perform?
> Also, Spectrum Analyzer?
>
> I'm looking at it for 2meter(150MHz) measurements.
> Is it suitable for testing the MO?
>
> Al K.
>
>
> Wed, 2011-10-05 at 18:47 +0000, Sam wrote:
> >
> > I have a 400 MHz Tektronix analog scope that came in very handy when
> > building the MSA. It is useful for every module that operates at the
> > IF frequency, or for looking at DDS outputs or the master oscillator.
> > Obviously it does not help with the PLOs, though you can use it to
> > look at the output of a mixer when the LO and RF are at nearby
> > frequencies, even though they are >1 GHz. A 100 MHz scope would be
> > almost as good, except for the MO.
> >
> > You don't absolutely need a scope to build the MSA, but if you run
> > into problems, nothing beats being able to look at actual waveforms.
> >
> > If space is more of an issue than money, check out the Picoscope
> > products, which are very nice and consist of a tiny box that
> > interfaces with the computer.
> >
> > Sam W.
> >
>

8554. USB Controller driver and programming

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-09 06:00:22 UTC
From: William Dillon
Topic: 8554 Message: 8554

Hi all,

I've got my custom USB control board booted and attached to Windows XP. I've followed the instructions in the "configuring USB adapter and installing drviers v2-0.doc" document, but I'm stuck on step 8 or 9 on the "New drivers" step by step section. First of all, in step 8, there isn't a "N2PK" option. There are variations of N2PK, version 2, version 5, 500mA, etc., but I don't know which to choose. When I choose one, and follow step 9 which is to unplug the USB and plug it back in, Windows doesn't ask for new drivers! What's the deal? Is there something I'm missing? Doesn't windows pick drivers based on the VID and PID? Don't those remain static?

Thanks for your help!
- Will

P.S. For anyone that mentioned being interested in this board when I posted about it earlier, I'm going to mail them out now that it appears that it works O.K. If you send me an email with your address I'll send one. It would be nice to receive a small donation on by blog if you like it, but that's up to you. Remember that it's not the larger Cypress chip, so it's limited a little.

8555. Re: [spectrumanalyzer] USB Controller driver and programming

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-09 13:29:42 UTC
From: william sprowls
Topic: 8554 Message: 8555

Hi Will,
 The USB installation instructions are not exact for MSA. Both Jim and I had difficulty. When using the "N2PK VNA Interface Control" window, some of the differences you want to see are:
In the Setup Tab:
USB Driver name should be "MSA USB device 0"
Bend_Ax filename should be "....\Vend_Ax.hex"
Configuration String should be "MSA FW"
Interface Type should check the MSA button.
In step:
8. In the "Write EEPROM" field of the same tab, select the "MSA USB Version..." option from the drop-down list and click "Write Data". That should result in a success message, and the EEPROM will have been programmed. Now click the "Read" button and check that it reads back the same string that was programmed in (see "Data to be written" at bottom of tab).

The version depends on using the Control Board or USB Stand-Alone.

This installation will operate the MSA using Version 116 and the beta MSA Software. However, there are a few bugs in both.

 The smaller Cypress chip is no problem. The small Cypress driving the SLIM Control Board will provide plenty of I/O's for now and in the future.
Scotty

--- On Sun, 10/9/11, William Dillon <hpux735@...> wrote:

From: William Dillon <hpux735@...>
Subject: [spectrumanalyzer] USB Controller driver and programming
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, October 9, 2011, 1:00 AM

Hi all,

I've got my custom USB control board booted and attached to Windows XP. I've followed the instructions in the "configuring USB adapter and installing drviers v2-0.doc" document, but I'm stuck on step 8 or 9 on the "New drivers" step by step section. First of all, in step 8, there isn't a "N2PK" option. There are variations of N2PK, version 2, version 5, 500mA, etc., but I don't know which to choose. When I choose one, and follow step 9 which is to unplug the USB and plug it back in, Windows doesn't ask for new drivers! What's the deal? Is there something I'm missing? Doesn't windows pick drivers based on the VID and PID? Don't those remain static?

Thanks for your help!

- Will

P.S. For anyone that mentioned being interested in this board when I posted about it earlier, I'm going to mail them out now that it appears that it works O.K. If you send me an email with your address I'll send one. It would be nice to receive a small donation on by blog if you like it, but that's up to you. Remember that it's not the larger Cypress chip, so it's limited a little.

8556. Re: USB Controller driver and programming

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-09 18:22:02 UTC
From: William Dillon
Topic: 8554 Message: 8556

I've figured it out!

In the instructions, it says to unplug the USB and plug it back in. This is O.K. if the device is bus powered, but because the USB control boards are self powered, you have to unplug it from power. Unplugging the USB doesn't really have any effect.

- Will

On Oct 8, 2011, at 11:00 PM, William Dillon wrote:

> Hi all,
>
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> Thanks for your help!
> - Will
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> P.S. For anyone that mentioned being interested in this board when I posted about it earlier, I'm going to mail them out now that it appears that it works O.K. If you send me an email with your address I'll send one. It would be nice to receive a small donation on by blog if you like it, but that's up to you. Remember that it's not the larger Cypress chip, so it's limited a little.

8557. Re: [spectrumanalyzer] Re: USB Controller driver and programming

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-10 10:15:48 UTC
From: Jim Hontoria
Topic: 8554 Message: 8557

Will,

After you get the driver sorted out, when you get to the point of running the MSA program with USB, remember to have in the MSA_Software directory both the msadll.dll and msadll.lib files.

Regarding the Cytrix chip size, you need ports A (accessed by the ADC), B and D (both accessed by the other SLIM modules) and C (used by the switches: video, band and external bridge). I don't think the small chip has all four.

Jim W1JGH

On Sun, Oct 9, 2011 at 2:22 PM, William Dillon <hpux735@...> wrote:

> **
>
>
> I've figured it out!
>
> In the instructions, it says to unplug the USB and plug it back in. This is
> O.K. if the device is bus powered, but because the USB control boards are
> self powered, you have to unplug it from power. Unplugging the USB doesn't
> really have any effect.
>
> - Will
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> On Oct 8, 2011, at 11:00 PM, William Dillon wrote:
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> "N2PK" option. There are variations of N2PK, version 2, version 5, 500mA,
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> which is to unplug the USB and plug it back in, Windows doesn't ask for new
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> limited a little.
>
>
>

--
Jim G. Hontoria

8558. Re: [spectrumanalyzer] USB Controller driver and programming

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-10 15:03:12 UTC
From: William Dillon
Topic: 8554 Message: 8558

Jim,

Thanks! I've gotten to the point that the MSA software _seems_ happy. I've had it say "the USB thing is either disconnected, or too old" and I figured that out, now it just starts. The problem now is that none of the I/O lines on the cypress do anything. I've hooked them up to a logic analyzer and I haven't seen any activity during restart, scan, etc. What is a good testing procedure for this? By the way, I've also set the control board setting in the hardware config manager to "(3) USB".

I discovered the limitation of the chip well after the board was designed. I don't have an electronically controlled video switch, band switch, or bridge, so, for now, I'm O.K. with the smaller device. Later, after I verify other parts of the design (high voltage supply, SLIM header wiring, etc.) I'll make a new one with the larger device.

Thanks again!
- Will

On Oct 10, 2011, at 3:15 AM, Jim Hontoria wrote:

>
> Will,
>
> After you get the driver sorted out, when you get to the point of running the MSA program with USB, remember to have in the MSA_Software directory both the msadll.dll and msadll.lib files.
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> Regarding the Cytrix chip size, you need ports A (accessed by the ADC), B and D (both accessed by the other SLIM modules) and C (used by the switches: video, band and external bridge). I don't think the small chip has all four.
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> On Sun, Oct 9, 2011 at 2:22 PM, William Dillon <hpux735@...> wrote:
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> --
> Jim G. Hontoria
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8559. Re: [spectrumanalyzer] USB Controller driver and programming

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-10 16:23:35 UTC
From: william sprowls
Topic: 8554 Message: 8559

Hi Will,
 You can use the "usb configure.exe" to test your I/O's.
Open it and in the tab:Communicate with Adapter,
click "Check VNA interface".
The Messages should print out
Usb Interface String Identifier : index=1 :Cypress
Usb Interface String Identifier : index=2 :MSA FWP
Endpoint: 1, Type BLK, Endpoint 2 OUT Max Packet Size 0x200
Endpoint: 2, Type BLK, Endpoint 6 IN Max Packet Size 0x200
MSA USB Interface Found
(or something to this effect, since I have the larger Cypress)

Now, click "Build Raw Message"
the window, "Set Port Lines" will open
Click Set Port B
change the value from 0x00 to 0x01
OK
window closes
The Raw Message will now show:
A6 02 00 01 00 00 00
click button, Write VNA Interface
On the Cypress chip, the Port B, bit 0 will go High.
You can highlight and change the A6 02 00 01 00 00 00 to A6 02 00 00 00 00 00, click Write VNA Interface, and the line should go Low.
Ta Da!

If you pass this test, your Cypress board is working and there may be something hosed with the MSA Configuration.

If you want, give me a phone call and we can work it out.
two one four, two two one, two two four zero
I also have Skype, user name:
wsprowls
Scotty

--- On Mon, 10/10/11, William Dillon <hpux735@...> wrote:

From: William Dillon <hpux735@...>
Subject: Re: [spectrumanalyzer] USB Controller driver and programming
To: spectrumanalyzer@yahoogroups.com
Date: Monday, October 10, 2011, 10:03 AM

Jim,
Thanks! I've gotten to the point that the MSA software _seems_ happy. I've had it say "the USB thing is either disconnected, or too old" and I figured that out, now it just starts. The problem now is that none of the I/O lines on the cypress do anything. I've

hooked them up to a logic analyzer and I haven't seen any activity during restart, scan, etc. What is a good testing procedure for this? By the way, I've also set the control board setting in the hardware config manager to "(3) USB".
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Thanks again!- Will
On Oct 10, 2011, at 3:15 AM, Jim Hontoria wrote:

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- Will

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Jim G. Hontoria

8560. Re: [spectrumanalyzer] USB Controller driver and programming

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-10 16:50:44 UTC
From: William Dillon
Topic: 8554 Message: 8560

Thanks Scotty!

I'll play around using your instructions for a while. If I continue to have trouble I'll try to get ahold of you over voice.

When I'm feeling more confident that I know what I'm doing, I'll write an article that brings together all of the steps in one place. By far the most trouble I've had was finding where the info was! :)

- Will

On Oct 10, 2011, at 9:23 AM, william sprowls wrote:

> Hi Will,
> You can use the "usb configure.exe" to test your I/O's.
> Open it and in the tab:Communicate with Adapter,
> click "Check VNA interface".
> The Messages should print out
> Usb Interface String Identifier : index=1 :Cypress
> Usb Interface String Identifier : index=2 :MSA FWP
> Endpoint: 1, Type BLK, Endpoint 2 OUT Max Packet Size 0x200
> Endpoint: 2, Type BLK, Endpoint 6 IN Max Packet Size 0x200
> MSA USB Interface Found
> (or something to this effect, since I have the larger Cypress)
>
> Now, click "Build Raw Message"
> the window, "Set Port Lines" will open
> Click Set Port B
> change the value from 0x00 to 0x01
> OK
> window closes
> The Raw Message will now show:
> A6 02 00 01 00 00 00
> click button, Write VNA Interface
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> Ta Da!
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> I also have Skype, user name:
> wsprowls

> Scotty
>
>
> --- On Mon, 10/10/11, William Dillon <hpux735@...> wrote:
>
> From: William Dillon <hpux735@...>
> Subject: Re: [spectrumanalyzer] USB Controller driver and programming
> To: spectrumanalyzer@yahoogroups.com
> Date: Monday, October 10, 2011, 10:03 AM
>
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>> Jim G. Hontoria
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8561. Re: [spectrumanalyzer] USB Controller driver and programming

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-10 16:57:53 UTC
From: william sprowls
Topic: 8554 Message: 8561

Will,
Oops, I hosed my own phone number:
nine seven two, two two one, two two four zero
(well, I never call myself, so I forget these things)
Scotty

--- On Mon, 10/10/11, william sprowls <wsprowls@...> wrote:

From: william sprowls <wsprowls@...>
Subject: Re: [spectrumanalyzer] USB Controller driver and programming
To: spectrumanalyzer@yahoogroups.com
Date: Monday, October 10, 2011, 11:23 AM

Hi Will,
 You can use the "usb configure.exe" to test your I/O's.
Open it and in the tab:Communicate with Adapter,
click "Check VNA interface".
The Messages should print out
Usb Interface String Identifier : index=1 :Cypress
Usb Interface String Identifier : index=2 :MSA FWP
Endpoint: 1, Type BLK, Endpoint 2 OUT Max Packet Size 0x200
Endpoint: 2, Type BLK, Endpoint 6 IN Max Packet Size 0x200
MSA USB Interface Found
(or something to this effect, since I have the larger Cypress)

Now, click "Build Raw Message"
the window, "Set Port Lines" will open
Click Set Port B
change the value from 0x00 to 0x01
OK
window closes
The Raw Message will now show:
A6 02 00 01 00 00 00
click button, Write VNA Interface
On the Cypress chip, the Port B, bit 0 will go High.
You can
highlight and change the A6 02 00 01 00 00 00 to A6 02 00 00 00 00 00, click Write VNA Interface, and the line should go Low.
Ta Da!

If you pass this test, your Cypress board is working and there may be something hosed with the MSA Configuration.

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two one four, two two one, two two four zero
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Scotty

--- On Mon, 10/10/11, William Dillon <hpux735@gmail.com> wrote:

From: William Dillon <hpux735@...>
Subject: Re: [spectrumanalyzer] USB Controller driver and programming
To: spectrumanalyzer@yahoogroups.com
Date: Monday, October 10, 2011, 10:03 AM

Jim,
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I discovered the limitation of the chip well after the board was designed. I don't have an electronically controlled video switch, band switch, or bridge, so, for now, I'm O.K. with the smaller device. Later, after I verify other parts of the design (high voltage supply, SLIM header wiring, etc.) I'll make a new one with the larger
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Thanks again!- Will
On Oct 10, 2011, at 3:15 AM, Jim Hontoria wrote:

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Regarding the Cytrix chip size, you need ports A (accessed by the ADC), B and D (both accessed by the other SLIM modules) and C (used by the switches: video, band and external bridge). I don't think the small chip has all four.
Jim W1JGH On Sun, Oct 9, 2011 at 2:22 PM, William Dillon <hpux735@...> wrote:

I've figured it out!

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- Will

On Oct 8, 2011, at 11:00 PM, William Dillon wrote:

> Hi all,

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--
Jim G. Hontoria

8562. Re: [spectrumanalyzer] USB Controller driver and programming

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-10 18:02:35 UTC
From: Jim Hontoria
Topic: 8554 Message: 8562

Will,

Once you get past the usb-configure testing, if the Spectrum Analyzer software is taking to the Cypress chip, you should see the SERCLK signal on A6 and the DATACLK iin B0, These are always on if the software is running. You can either use a scope or a frequency counter to see them. Make sure, just in case, that you have a recent version of the MSA software.

Jim, W1JGH

On Mon, Oct 10, 2011 at 12:57 PM, william sprowls <wsprowls@yahoo.com>wrote:

> **
>
>
> Will,
> Oops, I hosed my own phone number:
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> (well, I never call myself, so I forget these things)
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> (or something to this effect, since I have the larger Cypress)
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> Now, click "Build Raw Message"

> the window, "Set Port Lines" will open
> Click Set Port B
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> OK
> window closes
> The Raw Message will now show:
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Jim G. Hontoria

8563. Re: [spectrumanalyzer] USB Controller driver and programming

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 01:54:22 UTC
From: William Dillon
Topic: 8554 Message: 8563

Aaargh!

I got it working!!! And then, what did I do? I accidentally shorted RB0 to +10 volts and zapped the output! While I'm encouraged by it working, I'll have to wait a while to get a new cypress chip.

- Will

On Oct 10, 2011, at 11:02 AM, Jim Hontoria wrote:

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> Will,
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> Once you get past the usb-configure testing, if the Spectrum Analyzer software is taking to the Cypress chip, you should see the SERCLK signal on A6 and the DATACLK iin B0, These are always on if the software is running. You can either use a scope or a frequency counter to see them. Make sure, just in case, that you have a recent version of the MSA software.
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> Oops, I hosed my own phone number:
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> To: spectrumanalyzer@yahoogroups.com
> Date: Monday, October 10, 2011, 11:23 AM
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Date: 2011-10-11 02:02:27 UTC
From: Jim Hontoria
Topic: 8554 Message: 8564

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Look in eBay for EZ-USB FX2LP board.. It has the 128 pin chip. They ship
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8565. Re: [spectrumanalyzer] USB Controller driver and programming

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 02:35:06 UTC
From: William Dillon
Topic: 8554 Message: 8565

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8566. MSA kits or complete set of boards for revision C

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 10:08:09 UTC
From: stacywilliams6908
Topic: 8566 Message: 8566

Hi all

Please can somebody kindly advise me if full kits including boards are still available to buy for the the MSA project. Any advice, at all, would be greatly appreciated regarding these first few tender steps of this project.

With kind regards.

Stacy
M0WSA

8567. Re: [spectrumanalyzer] USB Controller driver and programming

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 11:09:50 UTC
From: Jim Hontoria
Topic: 8554 Message: 8567

What is your custom board and what size chip are you using?
If you use a 56 pin chip you won't have PORTC which is required for the switches.

Jim W1JGH

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>>> On Oct 10, 2011, at 3:15 AM, Jim Hontoria wrote:
>>>
>>>
>>>
>>> Will,
>>>
>>> After you get the driver sorted out, when you get to the point of running
>>> the MSA program with USB, remember to have in the MSA_Software directory
>>> both the msadll.dll and msadll.lib files.
>>>
>>> Regarding the Cytrix chip size, you need ports A (accessed by the ADC), B
>>> and D (both accessed by the other SLIM modules) and C (used by the switches:
>>> video, band and external bridge). I don't think the small chip has all four.
>>>
>>>
>>>
>>> Jim W1JGH
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>>>
>>> On Sun, Oct 9, 2011 at 2:22 PM, William Dillon <hpux735@...>wrote:
>>>
>>> **
>>>
>>>
>>> I've figured it out!
>>>
>>> In the instructions, it says to unplug the USB and plug it back in. This
>>> is O.K. if the device is bus powered, but because the USB control boards are
>>> self powered, you have to unplug it from power. Unplugging the USB doesn't
>>> really have any effect.
>>>
>>> - Will
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>>>
>>> On Oct 8, 2011, at 11:00 PM, William Dillon wrote:
>>>
>>> > Hi all,
>>> >
>>> > I've got my custom USB control board booted and attached to Windows XP.
>>> I've followed the instructions in the "configuring USB adapter and
>>> installing drviers v2-0.doc" document, but I'm stuck on step 8 or 9 on the
>>> "New drivers" step by step section. First of all, in step 8, there isn't a
>>> "N2PK" option. There are variations of N2PK, version 2, version 5, 500mA,
>>> etc., but I don't know which to choose. When I choose one, and follow step 9
>>> which is to unplug the USB and plug it back in, Windows doesn't ask for new
>>> drivers! What's the deal? Is there something I'm missing? Doesn't windows
>>> pick drivers based on the VID and PID? Don't those remain static?
>>> >
>>> > Thanks for your help!

>>> > - Will
>>> >
>>> > P.S. For anyone that mentioned being interested in this board when I
>>> posted about it earlier, I'm going to mail them out now that it appears that
>>> it works O.K. If you send me an email with your address I'll send one. It
>>> would be nice to receive a small donation on by blog if you like it, but
>>> that's up to you. Remember that it's not the larger Cypress chip, so it's
>>> limited a little.
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>>> Jim G. Hontoria
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Jim G. Hontoria

8568. Re: [spectrumanalyzer] MSA kits or complete set of boards for revision C

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 12:09:22 UTC
From: Neganur
Topic: 8566 Message: 8568

Hey Stacy

I don't think anyone is selling any kits at the moment. I myself bought the components at Digi-Key, Mini-Circuits and a local store.

In case you download pcbexpress and order a full panel of the needed PWB's with Scotty's pcb file (min order is two panels for a total of, was it $120 ?), I'd be happy to buy the extra panel from you.

Best regards

Chris

On 11 Oct 2011, at 13:08, "stacywilliams6908" <slateblue69@...> wrote:

> Hi all
>
> Please can somebody kindly advise me if full kits including boards are still available to buy for the the MSA project. Any advice, at all, would be greatly appreciated regarding these first few tender steps of this project.
>
> With kind regards.
>
> Stacy
> M0WSA
>
>

8569. Re: [spectrumanalyzer] MSA kits or complete set of boards for revision C

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 12:24:13 UTC
From: Jim Hontoria
Topic: 8566 Message: 8569

I have some fully functional, populated boards, including perimeter fence. Off-hand I recall the 4 mixers, PLO1, DDS1, MO, PDM and ADC. There may be more. Let me know if you are interested.

Jim W1JGH

On Tue, Oct 11, 2011 at 8:09 AM, Neganur <neganur@...> wrote:

> **
>
>
> Hey Stacy
>
> I don't think anyone is selling any kits at the moment. I myself bought the
> components at Digi-Key, Mini-Circuits and a local store.
>
> In case you download pcbexpress and order a full panel of the needed PWB's
> with Scotty's pcb file (min order is two panels for a total of, was it $120
> ?), I'd be happy to buy the extra panel from you.
>
> Best regards
>
> Chris
>
> On 11 Oct 2011, at 13:08, "stacywilliams6908" <slateblue69@...>
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> still available to buy for the the MSA project. Any advice, at all, would be
> greatly appreciated regarding these first few tender steps of this project.
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> With kind regards.
>
> Stacy
> M0WSA
>
>
>

--
Jim G. Hontoria

8570. Re: [spectrumanalyzer] MSA kits or complete set of boards for revision C

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 13:15:45 UTC
From: Stacy Williams
Topic: 8566 Message: 8570

Hi.

I have done the download and, I will order the boards when funds are available. Would you like me to order you another set of boards as well? Because, I will keep both sets as I'm not good with SMT. However, let me know and, I will Let you know when I'm ready to make the order! We can make payments via Paypal when the time comes.

Are all the boards SMT?

Stacy
M0WSA

On Tuesday, October 11, 2011, Neganur <neganur@...> wrote:
>
>
> Hey Stacy
> I don't think anyone is selling any kits at the moment. I myself bought the components at Digi-Key, Mini-Circuits and a local store.
> In case you download pcbexpress and order a full panel of the needed PWB's with Scotty's pcb file (min order is two panels for a total of, was it $120 ?), I'd be happy to buy the extra panel from you.
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> Best regards
> Chris
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>
>
> Hi all
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> Please can somebody kindly advise me if full kits including boards are still available to buy for the the MSA project. Any advice, at all, would be greatly appreciated regarding these first few tender steps of this project.
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> With kind regards.
>
> Stacy
> M0WSA
>
>

8571. Re: [spectrumanalyzer] MSA kits or complete set of boards for revision C

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 14:05:48 UTC
From: Neganur
Topic: 8566 Message: 8571

hey!

I think the Control Board has DIL-type ICs and at least one TO220 package (the voltage regulator).

Please order a full set for me as well, if you don't mind mailing it to Finland. Paypal is fine by me.

Chris

On 11 Oct 2011, at 16:15, Stacy Williams <slateblue69@...> wrote:

> Hi.
>
> I have done the download and, I will order the boards when funds are available. Would you like me to order you another set of boards as well? Because, I will keep both sets as I'm not good with SMT. However, let me know and, I will Let you know when I'm ready to make the order! We can make payments via Paypal when the time comes.
>
> Are all the boards SMT?
>
> Stacy
> M0WSA
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>

8572. MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 15:00:11 UTC
From: Sam
Topic: 8572 Message: 8572

I have done various layouts for a transmission/reflection switch and for a forward/reverse switch. A while ago we did a group board of a "signal router" which contained a relay version of both switches. It worked very well, but the relays are now very hard to find.

I'm now taking a slightly different approach. I believe that the MSA needs an internal Input Switch, which can choose among three inputs: SA, VNA transmission and VNA reflection. I have designed a board that will do this, using edge-launch connectors so it can mount on the front panel with the three input connectors sticking out. The output of the board runs to Mixer 1. This avoids the nightmare of connectors and cables that switches can present. This board replaces the existing MSA Input connector. Any forward/reverse switching would then be done separately in an external box, perhaps with a bridge enclosed.

I haven't built this particular board, but Lin and I have tested various versions of the switches, so I expect this board will work well. Transmission-Reflection isolation should be at least 120 dB to 500 MHz. Above that we'll have to see, but I expect at least 95 dB at 1 GHz. It is only about 2" square. I plan to order a few of these. If anyone is interested in participating, let me know. Depending what boards we end up incorporating, it may cost about $70 plus $15 per board set, so the ultimate cost per user depends on the number of participants. The boards will not have solder mask or silk-screening.

There are actually two alternative versions of the board. They are described at: <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_Input_Switch.pdf>

One caveat for those outside the US: In the past I have mailed small boards first class USPS, and they took about one month to arrive at non-US destinations (even Canada). I later tried Priority Mail to Germany, which cost $15 and the package ended up being returned to me with no explanation. So I have bad experience with foreign shipping.

One version of the board requires a single 12V G6Z-1F-A relay that is currently available only at Arrow, though they have a huge quantity. I can easily revise the layout to use the G6Z-1FE-A (about US$5.00), which has a slightly different footprint and is more available at Mouser and Arrow. The remainder of the switching is done by several PE4251. That IC is available from Richardson and is incredibly cheap (about US$1.10).

This board will allow a bridge/DUT arrangement to be cabled together and connected to the transmission and reflection inputs, and the MSA will select the proper input when scanning. Switching between SA and VNA is less automated, requiring a hardware switch--not a big deal since the cabling would be different for the two modes anyway, so some manual intervention is always necessary.

It actually will be possible to connect two separate external signals to the "transmission" and "reflection" inputs and use them for SA mode, with automatic switching between them, if that serves any purpose.

Finally, the user can always use the "SA" input for either SA or VNA mode, and ignore the transmission and reflection inputs if desired.

Sam W.

8573. Re: [spectrumanalyzer] USB Controller driver and programming

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 15:13:21 UTC
From: William Dillon
Topic: 8554 Message: 8573
Attachments: 2 described; binary payloads are missing from this source WARC

Yah, it uses the smaller chip. I'm O.K. with it at the moment because I don't have any of those things anyway. Later, I'm going to enhance the design to include the larger one. I'm also thinking of galvanically isolating the USB interface from the MSA. The Cypress has 3.3v I/O and all the SLIMs have 5, so I can mediate that voltage difference and isolate noise by using opto-isolators. For now, though, I'm happy with the board I've got, I just need to quit frying chips!

- Will

b.t.w., my custom board is based off Dave Robert's design, but adds the high voltage supply off the SLIM-CB and breaks the outputs out into individual SLIM connectors. I like having simple wiring harnesses. These are 1-to-1.

On Oct 11, 2011, at 4:09 AM, Jim Hontoria wrote:

>
> What is your custom board and what size chip are you using?
> If you use a 56 pin chip you won't have PORTC which is required for the switches.
>
> Jim W1JGH
>
> On Mon, Oct 10, 2011 at 10:35 PM, William Dillon <hpux735@...> wrote:
>
> Thanks for the idea, Jim
>
>
> I definitely want to keep using my custom board, but eBay gives me an idea. If I can buy a board for the same price as the IC on DigiKey, I must be able to get an IC cheaper. Indeed I can, for about $5. I may buy 3 of them, because these chips seem to be very sensitive. I'm completely sure that working with the Microchip PIC for so long has spoiled me! You can abuse those chips in obscene ways without breaking them!
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> On Oct 10, 2011, at 7:02 PM, Jim Hontoria wrote:
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>> Sincere condolences for the untimely demise.
>> Look in eBay for EZ-USB FX2LP board.. It has the 128 pin chip. They ship from China fairly quickly. You may have to touch up some of soldering. I thought that mine was bad and a dry soldering tip fixed it.
>>
>> Jim W1JGH
>> On Mon, Oct 10, 2011 at 9:54 PM, William Dillon <hpux735@...> wrote:

>>
>> Aaargh!
>>
>>
>> I got it working!!! And then, what did I do? I accidentally shorted RB0 to +10 volts and zapped the output! While I'm encouraged by it working, I'll have to wait a while to get a new cypress chip.
>>
>> - Will
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>> On Oct 10, 2011, at 11:02 AM, Jim Hontoria wrote:
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>>>
>>>
>>> Will,
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>>> Once you get past the usb-configure testing, if the Spectrum Analyzer software is taking to the Cypress chip, you should see the SERCLK signal on A6 and the DATACLK iin B0, These are always on if the software is running. You can either use a scope or a frequency counter to see them. Make sure, just in case, that you have a recent version of the MSA software.
>>>
>>> Jim, W1JGH
>>>
>>> On Mon, Oct 10, 2011 at 12:57 PM, william sprowls <wsprowls@yahoo.com> wrote:
>>>
>>> Will,
>>> Oops, I hosed my own phone number:
>>> nine seven two, two two one, two two four zero
>>> (well, I never call myself, so I forget these things)
>>> Scotty
>>>
>>> --- On Mon, 10/10/11, william sprowls <wsprowls@...> wrote:
>>>
>>> From: william sprowls <wsprowls@...>
>>>
>>> Subject: Re: [spectrumanalyzer] USB Controller driver and programming
>>> To: spectrumanalyzer@yahoogroups.com
>>> Date: Monday, October 10, 2011, 11:23 AM
>>>
>>>
>>>
>>> Hi Will,
>>> You can use the "usb configure.exe" to test your I/O's.
>>> Open it and in the tab:Communicate with Adapter,
>>> click "Check VNA interface".
>>> The Messages should print out
>>> Usb Interface String Identifier : index=1 :Cypress
>>> Usb Interface String Identifier : index=2 :MSA FWP
>>> Endpoint: 1, Type BLK, Endpoint 2 OUT Max Packet Size 0x200

>>> Endpoint: 2, Type BLK, Endpoint 6 IN Max Packet Size 0x200
>>> MSA USB Interface Found
>>> (or something to this effect, since I have the larger Cypress)
>>>
>>> Now, click "Build Raw Message"
>>> the window, "Set Port Lines" will open
>>> Click Set Port B
>>> change the value from 0x00 to 0x01
>>> OK
>>> window closes
>>> The Raw Message will now show:
>>> A6 02 00 01 00 00 00
>>> click button, Write VNA Interface
>>> On the Cypress chip, the Port B, bit 0 will go High.
>>> You can highlight and change the A6 02 00 01 00 00 00 to A6 02 00 00 00 00 00, click Write VNA Interface, and the line should go Low.
>>> Ta Da!
>>>
>>> If you pass this test, your Cypress board is working and there may be something hosed with the MSA Configuration.
>>>
>>> If you want, give me a phone call and we can work it out.
>>> two one four, two two one, two two four zero
>>> I also have Skype, user name:
>>> wsprowls
>>> Scotty
>>>
>>>
>>> --- On Mon, 10/10/11, William Dillon <hpux735@...> wrote:
>>>
>>> From: William Dillon <hpux735@...>
>>> Subject: Re: [spectrumanalyzer] USB Controller driver and programming
>>> To: spectrumanalyzer@yahoogroups.com
>>> Date: Monday, October 10, 2011, 10:03 AM
>>>
>>>
>>> Jim,
>>>
>>> Thanks! I've gotten to the point that the MSA software _seems_ happy. I've had it say "the USB thing is either disconnected, or too old" and I figured that out, now it just starts. The problem now is that none of the I/O lines on the cypress do anything. I've hooked them up to a logic analyzer and I haven't seen any activity during restart, scan, etc. What is a good testing procedure for this? By the way, I've also set the control board setting in the hardware config manager to "(3) USB".
>>>
>>> I discovered the limitation of the chip well after the board was designed. I don't have an electronically controlled video switch, band switch, or bridge, so, for now, I'm O.K. with the smaller device. Later, after I verify other parts of the design (high voltage supply, SLIM header wiring, etc.) I'll make a new one with the larger device.
>>>

>>> Thanks again!
>>> - Will
>>>
>>> On Oct 10, 2011, at 3:15 AM, Jim Hontoria wrote:
>>>
>>>>
>>>>
>>>> Will,
>>>>
>>>> After you get the driver sorted out, when you get to the point of running the MSA program with USB, remember to have in the MSA_Software directory both the msadll.dll and msadll.lib files.
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>>>> Regarding the Cytrix chip size, you need ports A (accessed by the ADC), B and D (both accessed by the other SLIM modules) and C (used by the switches: video, band and external bridge). I don't think the small chip has all four.
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>>>> On Oct 8, 2011, at 11:00 PM, William Dillon wrote:
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>>>> >
>>>> > Thanks for your help!
>>>> > - Will
>>>> >
>>>> > P.S. For anyone that mentioned being interested in this board when I posted about it

earlier, I'm going to mail them out now that it appears that it works O.K. If you send me an email with your address I'll send one. It would be nice to receive a small donation on by blog if you like it, but that's up to you. Remember that it's not the larger Cypress chip, so it's limited a little.
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> Jim G. Hontoria
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8574. Re: [spectrumanalyzer] MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 15:27:06 UTC
From: Jurgen
Topic: 8572 Message: 8574

Hello Sam,

I would like to participate,

Jurgen

On 10/11/2011 11:00 AM, Sam wrote:
>
> I have done various layouts for a transmission/reflection switch and
> for a forward/reverse switch. A while ago we did a group board of a
> "signal router" which contained a relay version of both switches. It
> worked very well, but the relays are now very hard to find.
>
> I'm now taking a slightly different approach. I believe that the MSA
> needs an internal Input Switch, which can choose among three inputs:
> SA, VNA transmission and VNA reflection. I have designed a board that
> will do this, using edge-launch connectors so it can mount on the
> front panel with the three input connectors sticking out. The output
> of the board runs to Mixer 1. This avoids the nightmare of connectors
> and cables that switches can present. This board replaces the existing
> MSA Input connector. Any forward/reverse switching would then be done
> separately in an external box, perhaps with a bridge enclosed.
>
> I haven't built this particular board, but Lin and I have tested
> various versions of the switches, so I expect this board will work
> well. Transmission-Reflection isolation should be at least 120 dB to
> 500 MHz. Above that we'll have to see, but I expect at least 95 dB at
> 1 GHz. It is only about 2" square. I plan to order a few of these. If
> anyone is interested in participating, let me know. Depending what
> boards we end up incorporating, it may cost about $70 plus $15 per
> board set, so the ultimate cost per user depends on the number of
> participants. The boards will not have solder mask or silk-screening.
>
> There are actually two alternative versions of the board. They are
> described at:
> <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_Input_Switch.pdf>
>
> One caveat for those outside the US: In the past I have mailed small
> boards first class USPS, and they took about one month to arrive at
> non-US destinations (even Canada). I later tried Priority Mail to
> Germany, which cost $15 and the package ended up being returned to me
> with no explanation. So I have bad experience with foreign shipping.
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> One version of the board requires a single 12V G6Z-1F-A relay that is
> currently available only at Arrow, though they have a huge quantity. I
> can easily revise the layout to use the G6Z-1FE-A (about US$5.00),

> which has a slightly different footprint and is more available at
> Mouser and Arrow. The remainder of the switching is done by several
> PE4251. That IC is available from Richardson and is incredibly cheap
> (about US$1.10).
>
> This board will allow a bridge/DUT arrangement to be cabled together
> and connected to the transmission and reflection inputs, and the MSA
> will select the proper input when scanning. Switching between SA and
> VNA is less automated, requiring a hardware switch--not a big deal
> since the cabling would be different for the two modes anyway, so some
> manual intervention is always necessary.
>
> It actually will be possible to connect two separate external signals
> to the "transmission" and "reflection" inputs and use them for SA
> mode, with automatic switching between them, if that serves any purpose.
>
> Finally, the user can always use the "SA" input for either SA or VNA
> mode, and ignore the transmission and reflection inputs if desired.
>
> Sam W.
>
>

8575. Re: [spectrumanalyzer] USB Controller driver and programming

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 17:27:56 UTC
From: william sprowls
Topic: 8554 Message: 8575

Hi All,
 In regards to Jim's comment about Port C of the Cypress chip.
I have made a decision regarding USB and the MSA. It should satisfy most MSA builders, but alas, not all.
 I am supporting the use of the 56 pin version of the Cypress. I am also supporting the capability of the Cypress to drive the SLIM Control Board, not for driving the SLIM Modules directly. For this, only Cypress Ports A, B and D are required.
 There are several reasons for my decision:
1. 95% of the MSA builders already have the SLIM Control Board in the building stage or in use. Many are looking to use their MSA with USB without major hardware reconfiguration (mainly, wiring).
2. The Cypress chip is not very rugged and really needs buffering to drive the MSA modules. The SLIM Control board already utilizes buffers. Designing a new buffer board is re-inventing the wheel.
3. There have already been a few pwb designs that use the 56 pin Cypress (Dave's V04). There are also a few varieties of the FX2 board (128 pin Cypress) on E-bay.They will all work with my scheme.
4. The USB board/SLIM Control Board combination (call it USB-SCB) will provide 32 output lines and 5 input lines. We have MSA module designs requiring a total of 22 outputs and 2 inputs. So there is room for expansion. If we really need more than 32, I can redesign the SLIM Control board for 56 outputs and 5 inputs.
5. Designing a pwb that uses the 128 pin Cypress is easy, but to solder one of these puppies is not.
6. A single USB command procedure for USB-SCB will minimize the effort to keep the software current.

 I am designing a SLIM pwb that contains the 56 pin Cypress and an LPT type D25 male connector that will directly mate with the SLIM Control Board. It is just a minor re-configuration of Dave's V04 design that was done for N2PK. For those who already have Dave's board, this new pwb can be sliced apart and the connector side be used as an interface between the V04 and the SLIM Control Board.

Here are a few other things I have planned.
The upcoming MSA Software version 116 will utilize this USB-SCB scheme. The following version 200 will be a software and hardware upgrade to allow faster sweeping for both Spectrum Analyzer and VNA. I am contemplating that it should support only the SLIM MSA and not the Original MSA.

Scotty

--- On Tue, 10/11/11, Jim Hontoria <jghalpha@...m> wrote:

From: Jim Hontoria <jghalpha@...>
Subject: Re: [spectrumanalyzer] USB Controller driver and programming
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, October 11, 2011, 6:09 AM

What is your custom board and what size chip are you using? If you use a 56 pin chip you won't have PORTC which is required for the switches. Jim W1JGH

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- Will
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Jim W1JGH
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- Will
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Will, Once you get past the usb-configure testing, if the Spectrum Analyzer software is taking to the Cypress chip, you should see the SERCLK signal on A6 and the DATACLK iin B0, These are always on if the software is running. You can either use a scope or a frequency counter to see them. Make sure, just in case, that you have a recent version of the MSA software.

Jim, W1JGH

On Mon, Oct 10, 2011 at 12:57 PM, william sprowls <wsprowls@...> wrote:

Will,
Oops, I hosed my own phone number:
nine seven two, two two one, two two four zero

(well, I never call myself, so I forget these things)
Scotty

--- On Mon, 10/10/11, william sprowls <wsprowls@...> wrote:

From: william sprowls <wsprowls@...>
Subject: Re: [spectrumanalyzer] USB Controller driver and programming
To: spectrumanalyzer@yahoogroups.com

Date: Monday, October 10, 2011, 11:23 AM

Hi Will,
 You can use the "usb configure.exe" to test your I/O's.

Open it and in the tab:Communicate with Adapter,
click "Check VNA interface".
The Messages should print out
Usb Interface String Identifier : index=1 :Cypress
Usb Interface String Identifier : index=2 :MSA FWP

Endpoint: 1, Type BLK, Endpoint 2 OUT Max Packet Size 0x200
Endpoint: 2, Type BLK, Endpoint 6 IN Max Packet Size 0x200
MSA USB Interface Found
(or something to this effect, since I have the larger Cypress)

Now, click "Build Raw Message"
the window, "Set Port Lines" will open
Click Set Port B
change the value from 0x00 to 0x01
OK
window closes
The Raw Message will now show:
A6 02 00 01 00 00 00

click button, Write VNA Interface
On the Cypress chip, the Port B, bit 0 will go
High.
You can
highlight and change the A6 02 00 01 00 00 00 to A6 02 00 00 00 00 00, click Write VNA Interface, and the line should go Low.
Ta Da!

If you pass this test, your Cypress board is working and there may be something hosed with the MSA Configuration.

If you want, give me a phone call and we can work it out.
two one four, two two one, two two four zero
I also have Skype, user name:
wsprowls
Scotty

--- On Mon, 10/10/11, William Dillon <hpux735@...> wrote:

From: William Dillon <hpux735@...>
Subject: Re: [spectrumanalyzer] USB Controller driver and programming

To: spectrumanalyzer@yahoogroups.com
Date: Monday, October 10, 2011, 10:03 AM

Jim,
Thanks! I've gotten to the point that the MSA software _seems_ happy. I've had it say "the USB thing is either disconnected, or too old" and I figured that out, now it just starts. The problem now is that none of the I/O lines on the cypress do anything. I've hooked them up to a logic analyzer and I haven't seen any activity during restart, scan, etc. What is a good testing procedure for this? By the way, I've also set the control

board setting in the hardware config manager to "(3) USB".

I discovered the limitation of the chip well after the board was designed. I don't have an electronically controlled video switch, band switch, or bridge, so, for now, I'm O.K. with the smaller device. Later, after I verify other parts of the design (high voltage supply, SLIM header wiring, etc.) I'll make a new one with the larger
device.
Thanks again!- Will
On Oct 10, 2011, at 3:15 AM, Jim Hontoria wrote:

Will, After you get the driver sorted out, when you get to the point of running the MSA program with USB, remember to have in the MSA_Software directory both the msadll.dll and msadll.lib files.

 Regarding the Cytrix chip size, you need ports A (accessed by the ADC), B and D (both accessed by the other SLIM modules) and C (used by the switches: video, band and external bridge). I don't think the small chip has all four.

  Jim W1JGH On Sun, Oct 9, 2011 at 2:22 PM, William Dillon <hpux735@...> wrote:

I've figured it out!

In the instructions, it says to unplug the USB and plug it back in. This is O.K. if the device is bus powered, but because the USB control boards are self powered, you have to unplug it from power. Unplugging the USB doesn't really have any effect.

- Will

On Oct 8, 2011, at 11:00 PM, William Dillon wrote:

> Hi all,

>

> I've got my custom USB control board booted and attached to Windows XP. I've followed the instructions in the "configuring USB adapter and installing drviers v2-0.doc" document, but I'm stuck on step 8 or 9 on the "New drivers" step by step section. First of all, in step 8, there isn't a "N2PK" option. There are variations of N2PK, version 2, version 5, 500mA, etc., but I don't know which to choose. When I choose one, and follow step 9 which is to unplug the USB and plug it back in, Windows doesn't ask for new drivers! What's the deal? Is there something I'm missing? Doesn't windows pick drivers based on the VID and PID? Don't those remain static?

>

> Thanks for your help!

> - Will

>

> P.S. For anyone that mentioned being interested in this board when I posted about it earlier, I'm going to mail them out now that it appears that it works O.K. If you send me an email with your address I'll send one. It would be nice to receive a small donation on by blog if you like it, but that's up to you. Remember that it's not the larger Cypress

chip, so it's limited a little.

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Jim G. Hontoria

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Jim G. Hontoria

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Jim G. Hontoria

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Jim G. Hontoria

8576. Re: [spectrumanalyzer] USB Controller driver and programming

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 18:20:31 UTC
From: William Dillon
Topic: 8554 Message: 8576

Hi Scotty,

Thanks for giving your vision for the project. It's nice to know which direction the bus is headed. Given this, I'm still likely to design a new board, even if it's just for myself. The reason is that I got really frustrated with the mess of digital wiring at the control board. I pulled my hair out too many times trying to figure out what was happening. I will essentially combine the logic buffers and cypress into a single board with HV supply. It is hugely important to me to have one header for one SLIM.

Like I said, it's O.K. if I'm only designing it for myself. Also, I know that when you go off the reservation with SLIMs that you're on your own.

- Will

On Oct 11, 2011, at 10:27 AM, william sprowls wrote:

> Hi All,
> In regards to Jim's comment about Port C of the Cypress chip.
> I have made a decision regarding USB and the MSA. It should satisfy most MSA builders, but alas, not all.
> I am supporting the use of the 56 pin version of the Cypress. I am also supporting the capability of the Cypress to drive the SLIM Control Board, not for driving the SLIM Modules directly. For this, only Cypress Ports A, B and D are required.
> There are several reasons for my decision:
> 1. 95% of the MSA builders already have the SLIM Control Board in the building stage or in use. Many are looking to use their MSA with USB without major hardware reconfiguration (mainly, wiring).
> 2. The Cypress chip is not very rugged and really needs buffering to drive the MSA modules. The SLIM Control board already utilizes buffers. Designing a new buffer board is re-inventing the wheel.
> 3. There have already been a few pwb designs that use the 56 pin Cypress (Dave's V04). There are also a few varieties of the FX2 board (128 pin Cypress) on E-bay.They will all work with my scheme.
> 4. The USB board/SLIM Control Board combination (call it USB-SCB) will provide 32 output lines and 5 input lines. We have MSA module designs requiring a total of 22 outputs and 2 inputs. So there is room for expansion. If we really need more than 32, I can redesign the SLIM Control board for 56 outputs and 5 inputs.
> 5. Designing a pwb that uses the 128 pin Cypress is easy, but to solder one of these puppies is not.
> 6. A single USB command procedure for USB-SCB will minimize the effort to keep the software current.
>
> I am designing a SLIM pwb that contains the 56 pin Cypress and an LPT type D25 male connector that will directly mate with the SLIM Control Board. It is just a minor re-configuration of Dave's V04 design that was done for N2PK. For those who already have Dave's board, this new pwb can be sliced apart and the connector side be used as an

interface between the V04 and the SLIM Control Board.
>
> Here are a few other things I have planned.
> The upcoming MSA Software version 116 will utilize this USB-SCB scheme. The following version 200 will be a software and hardware upgrade to allow faster sweeping for both Spectrum Analyzer and VNA. I am contemplating that it should support only the SLIM MSA and not the Original MSA.
>
> Scotty
>
> --- On Tue, 10/11/11, Jim Hontoria <jghalpha@...> wrote:
>
> From: Jim Hontoria <jghalpha@...>
> Subject: Re: [spectrumanalyzer] USB Controller driver and programming
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, October 11, 2011, 6:09 AM
>
>
> What is your custom board and what size chip are you using?
> If you use a 56 pin chip you won't have PORTC which is required for the switches.
>
> Jim W1JGH
>
> On Mon, Oct 10, 2011 at 10:35 PM, William Dillon <hpux735@...> wrote:
>
> Thanks for the idea, Jim
>
>
> I definitely want to keep using my custom board, but eBay gives me an idea. If I can buy a board for the same price as the IC on DigiKey, I must be able to get an IC cheaper. Indeed I can, for about $5. I may buy 3 of them, because these chips seem to be very sensitive. I'm completely sure that working with the Microchip PIC for so long has spoiled me! You can abuse those chips in obscene ways without breaking them!
>
> - Will
>
> On Oct 10, 2011, at 7:02 PM, Jim Hontoria wrote:
>
>>
>>
>> Sincere condolences for the untimely demise.
>> Look in eBay for EZ-USB FX2LP board.. It has the 128 pin chip. They ship from China fairly quickly. You may have to touch up some of soldering. I thought that mine was bad and a dry soldering tip fixed it.
>>
>> Jim W1JGH
>> On Mon, Oct 10, 2011 at 9:54 PM, William Dillon <hpux735@...> wrote:
>>
>> Aaargh!
>>
>>

>> I got it working!!! And then, what did I do? I accidentally shorted RB0 to +10 volts and zapped the output! While I'm encouraged by it working, I'll have to wait a while to get a new cypress chip.
>>
>> - Will
>>
>> On Oct 10, 2011, at 11:02 AM, Jim Hontoria wrote:
>>
>>>
>>>
>>> Will,
>>>
>>> Once you get past the usb-configure testing, if the Spectrum Analyzer software is taking to the Cypress chip, you should see the SERCLK signal on A6 and the DATACLK iin B0, These are always on if the software is running. You can either use a scope or a frequency counter to see them. Make sure, just in case, that you have a recent version of the MSA software.
>>>
>>> Jim, W1JGH
>>>
>>> On Mon, Oct 10, 2011 at 12:57 PM, william sprowls <wsprowls@...> wrote:
>>>
>>> Will,
>>> Oops, I hosed my own phone number:
>>> nine seven two, two two one, two two four zero
>>> (well, I never call myself, so I forget these things)
>>> Scotty
>>>
>>> --- On Mon, 10/10/11, william sprowls <wsprowls@...> wrote:
>>>
>>> From: william sprowls <wsprowls@...>
>>>
>>> Subject: Re: [spectrumanalyzer] USB Controller driver and programming
>>> To: spectrumanalyzer@yahoogroups.com
>>> Date: Monday, October 10, 2011, 11:23 AM
>>>
>>>
>>>
>>> Hi Will,
>>> You can use the "usb configure.exe" to test your I/O's.
>>> Open it and in the tab:Communicate with Adapter,
>>> click "Check VNA interface".
>>> The Messages should print out
>>> Usb Interface String Identifier : index=1 :Cypress
>>> Usb Interface String Identifier : index=2 :MSA FWP
>>> Endpoint: 1, Type BLK, Endpoint 2 OUT Max Packet Size 0x200
>>> Endpoint: 2, Type BLK, Endpoint 6 IN Max Packet Size 0x200
>>> MSA USB Interface Found
>>> (or something to this effect, since I have the larger Cypress)
>>>

>>> Now, click "Build Raw Message"
>>> the window, "Set Port Lines" will open
>>> Click Set Port B
>>> change the value from 0x00 to 0x01
>>> OK
>>> window closes
>>> The Raw Message will now show:
>>> A6 02 00 01 00 00 00
>>> click button, Write VNA Interface
>>> On the Cypress chip, the Port B, bit 0 will go High.
>>> You can highlight and change the A6 02 00 01 00 00 00 to A6 02 00 00 00 00 00, click Write VNA Interface, and the line should go Low.
>>> Ta Da!
>>>
>>> If you pass this test, your Cypress board is working and there may be something hosed with the MSA Configuration.
>>>
>>> If you want, give me a phone call and we can work it out.
>>> two one four, two two one, two two four zero
>>> I also have Skype, user name:
>>> wsprowls
>>> Scotty
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>>>
>>> --- On Mon, 10/10/11, William Dillon <hpux735@...> wrote:
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>>> From: William Dillon <hpux735@...>
>>> Subject: Re: [spectrumanalyzer] USB Controller driver and programming
>>> To: spectrumanalyzer@yahoogroups.com
>>> Date: Monday, October 10, 2011, 10:03 AM
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>>> Jim,
>>>
>>> Thanks! I've gotten to the point that the MSA software _seems_ happy. I've had it say "the USB thing is either disconnected, or too old" and I figured that out, now it just starts. The problem now is that none of the I/O lines on the cypress do anything. I've hooked them up to a logic analyzer and I haven't seen any activity during restart, scan, etc. What is a good testing procedure for this? By the way, I've also set the control board setting in the hardware config manager to "(3) USB".
>>>
>>> I discovered the limitation of the chip well after the board was designed. I don't have an electronically controlled video switch, band switch, or bridge, so, for now, I'm O.K. with the smaller device. Later, after I verify other parts of the design (high voltage supply, SLIM header wiring, etc.) I'll make a new one with the larger device.
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>>> Thanks again!
>>> - Will
>>>
>>> On Oct 10, 2011, at 3:15 AM, Jim Hontoria wrote:

>>>
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>>>> Will,
>>>>
>>>> After you get the driver sorted out, when you get to the point of running the MSA program with USB, remember to have in the MSA_Software directory both the msadll.dll and msadll.lib files.
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>>>> Regarding the Cytrix chip size, you need ports A (accessed by the ADC), B and D (both accessed by the other SLIM modules) and C (used by the switches: video, band and external bridge). I don't think the small chip has all four.
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>>>> Jim W1JGH
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>>>> On Sun, Oct 9, 2011 at 2:22 PM, William Dillon <hpux735@...> wrote:
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>>>> I've figured it out!
>>>>
>>>> In the instructions, it says to unplug the USB and plug it back in. This is O.K. if the device is bus powered, but because the USB control boards are self powered, you have to unplug it from power. Unplugging the USB doesn't really have any effect.
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>>>> - Will
>>>>
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>>>>
>>>> On Oct 8, 2011, at 11:00 PM, William Dillon wrote:
>>>>
>>>> > Hi all,
>>>> >
>>>> > I've got my custom USB control board booted and attached to Windows XP. I've followed the instructions in the "configuring USB adapter and installing drviers v2-0.doc" document, but I'm stuck on step 8 or 9 on the "New drivers" step by step section. First of all, in step 8, there isn't a "N2PK" option. There are variations of N2PK, version 2, version 5, 500mA, etc., but I don't know which to choose. When I choose one, and follow step 9 which is to unplug the USB and plug it back in, Windows doesn't ask for new drivers! What's the deal? Is there something I'm missing? Doesn't windows pick drivers based on the VID and PID? Don't those remain static?
>>>> >
>>>> > Thanks for your help!
>>>> > - Will
>>>> >
>>>> > P.S. For anyone that mentioned being interested in this board when I posted about it earlier, I'm going to mail them out now that it appears that it works O.K. If you send me an email with your address I'll send one. It would be nice to receive a small donation on by blog if you like it, but that's up to you. Remember that it's not the larger Cypress chip, so it's limited a little.

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>>>> Jim G. Hontoria
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8577. Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 18:48:35 UTC
From: g3wie
Topic: 8572 Message: 8577

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I'm now taking a slightly different approach. I believe that the MSA needs an internal Input Switch, which can choose among three inputs: SA, VNA transmission and VNA reflection. I have designed a board that will do this, using edge-launch connectors so it can mount on the front panel with the three input connectors sticking out.

Hi Sam

I'd like to join in as well

Chris G3WIE

8578. Reference Plot Needed

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 19:29:29 UTC
From: Eric Nystrom
Topic: 8578 Message: 8578

Could someone post a screen capture of the PDM test or the Cavity Filter test in VNA transmission mode showing amplitude and phase. I am trying to determine if my phase plot is correct or inverted and would like to have a correct one for reference.

Thanks.

Eric Nystrom

8579. Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 20:21:58 UTC
From: davidhooau
Topic: 8572 Message: 8579

Hi Sam,

Count me in please.

I've had lots of PCBs posted to me here in Oz, and surface mail has taken 2-3 weeks.

Thanks,

davidh

>
> I haven't built this particular board, but Lin and I have tested various versions of the switches, so I expect this board will work well. Transmission-Reflection isolation should be at least 120 dB to 500 MHz. Above that we'll have to see, but I expect at least 95 dB at 1 GHz. It is only about 2" square. I plan to order a few of these. If anyone is interested in participating, let me know. Depending what boards we end up incorporating, it may cost about $70 plus $15 per board set, so the ultimate cost per user depends on the number of participants. The boards will not have solder mask or silk-screening.
>

8580. Re: [spectrumanalyzer] Reference Plot Needed

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 22:26:31 UTC
From: william sprowls
Topic: 8578 Message: 8580

Hi Eric, On the page:
http://scottyspectrumanalyzer.com/trouble.html
Look near the bottom of the page for "MSA Frequency Range Test" for Phase Plot.
 We don't do the Cavity Filter test in VNA Mode, the phase would not be viable.

Also, there are more plots on the page:
http://scottyspectrumanalyzer.com/functionvnatrans.html

Both of these pages can be accessed from the Main Page:
http://scottyspectrumanalyzer.com/

Scotty

--- On Tue, 10/11/11, Eric Nystrom <gloimon@...> wrote:

From: Eric Nystrom <gloimon@yahoo.com>
Subject: [spectrumanalyzer] Reference Plot Needed
To: "Spectrum Analyzer" <spectrumanalyzer@yahoogroups.com>
Date: Tuesday, October 11, 2011, 2:29 PM

Could someone post a screen capture of the PDM test or the Cavity Filter test in VNA
transmission mode showing amplitude and phase. I am trying to determine if my
phase plot is correct or inverted and would like to have a correct one for reference.

Thanks.

Eric Nystrom

8581. Re: Reference Plot Needed

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 22:50:46 UTC
From: Sam
Topic: 8578 Message: 8581

Eric,
I don't have such a plot, but if you do a transmission scan (without a line calibration) with TG cabled to the MSA input, you should get lines that slope downward as frequency increases, hit the bottom, wrap to the top, continue downward.... If your phase is reversed the lines will slope upward. That is, phase should be decreasing (meaning more phase delay) as frequency increases.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> Could someone post a screen capture of the PDM test or the Cavity Filter test in VNA
> transmission mode showing amplitude and phase. I am trying to determine if my
> phase plot is correct or inverted and would like to have a correct one for reference.
>
> Thanks.
>
>
> Eric Nystrom
>

8582. Re: [spectrumanalyzer] MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 23:21:07 UTC
From: Bill Maxwell
Topic: 8572 Message: 8582

Hi Sam

I would like to join this board set buy.

In 50 years, I have never had a problem with USPS deliveries to Australia. Can't always say the same for the product shipped but that is another matter entirely.

73 Bill VK7MX

On 12/10/2011 2:00 AM, Sam wrote:
> I have done various layouts for a transmission/reflection switch and for a forward/reverse switch. A while ago we did a group board of a "signal router" which contained a relay version of both switches. It worked very well, but the relays are now very hard to find.
>
> I'm now taking a slightly different approach. I believe that the MSA needs an internal Input Switch, which can choose among three inputs: SA, VNA transmission and VNA reflection. I have designed a board that will do this, using edge-launch connectors so it can mount on the front panel with the three input connectors sticking out. The output of the board runs to Mixer 1. This avoids the nightmare of connectors and cables that switches can present. This board replaces the existing MSA Input connector. Any forward/reverse switching would then be done separately in an external box, perhaps with a bridge enclosed.
>
> I haven't built this particular board, but Lin and I have tested various versions of the switches, so I expect this board will work well. Transmission-Reflection isolation should be at least 120 dB to 500 MHz. Above that we'll have to see, but I expect at least 95 dB at 1 GHz. It is only about 2" square. I plan to order a few of these. If anyone is interested in participating, let me know. Depending what boards we end up incorporating, it may cost about $70 plus $15 per board set, so the ultimate cost per user depends on the number of participants. The boards will not have solder mask or silk-screening.
>
> There are actually two alternative versions of the board. They are described at:
> <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_Input_Switch.pdf>
>
> One caveat for those outside the US: In the past I have mailed small boards first class USPS, and they took about one month to arrive at non-US destinations (even Canada). I later tried Priority Mail to Germany, which cost $15 and the package ended up being returned to me with no explanation. So I have bad experience with foreign shipping.
>
> One version of the board requires a single 12V G6Z-1F-A relay that is currently available only at Arrow, though they have a huge quantity. I can easily revise the layout to use the G6Z-1FE-A (about US$5.00), which has a slightly different footprint and is more available at Mouser and Arrow. The remainder of the switching is done by several PE4251. That IC is available from Richardson and is incredibly cheap (about US$1.10).
>

> This board will allow a bridge/DUT arrangement to be cabled together and connected to the transmission and reflection inputs, and the MSA will select the proper input when scanning. Switching between SA and VNA is less automated, requiring a hardware switch--not a big deal since the cabling would be different for the two modes anyway, so some manual intervention is always necessary.
>
> It actually will be possible to connect two separate external signals to the "transmission" and "reflection" inputs and use them for SA mode, with automatic switching between them, if that serves any purpose.
>
> Finally, the user can always use the "SA" input for either SA or VNA mode, and ignore the transmission and reflection inputs if desired.
>
> Sam W.
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> Yahoo! Groups Links
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8583. Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-11 23:47:34 UTC
From: stacywilliams6908
Topic: 8572 Message: 8583

Hi Sam

I'm afraid, I'm the newbie around here;). However, in for a penny then in for a pound, or you can use dollars too!

Take my name! I'm in too.

73
Stacy Williams
M0WSA

--- In spectrumanalyzer@yahoogroups.com, Bill Maxwell <wrmaxwell@...> wrote:
>
> Hi Sam
>
> I would like to join this board set buy.
>
> In 50 years, I have never had a problem with USPS deliveries to
> Australia. Can't always say the same for the product shipped but that is
> another matter entirely.
>
> 73 Bill VK7MX
>
> On 12/10/2011 2:00 AM, Sam wrote:
> > I have done various layouts for a transmission/reflection switch and for a forward/reverse switch. A while ago we did a group board of a "signal router" which contained a relay version of both switches. It worked very well, but the relays are now very hard to find.
> >
> > I'm now taking a slightly different approach. I believe that the MSA needs an internal Input Switch, which can choose among three inputs: SA, VNA transmission and VNA reflection. I have designed a board that will do this, using edge-launch connectors so it can mount on the front panel with the three input connectors sticking out. The output of the board runs to Mixer 1. This avoids the nightmare of connectors and cables that switches can present. This board replaces the existing MSA Input connector. Any forward/reverse switching would then be done separately in an external box, perhaps with a bridge enclosed.
> >
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> > There are actually two alternative versions of the board. They are described at:

> > <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_Input_Switch.pdf>
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> > One caveat for those outside the US: In the past I have mailed small boards first class USPS, and they took about one month to arrive at non-US destinations (even Canada). I later tried Priority Mail to Germany, which cost $15 and the package ended up being returned to me with no explanation. So I have bad experience with foreign shipping.
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> >
> > Finally, the user can always use the "SA" input for either SA or VNA mode, and ignore the transmission and reflection inputs if desired.
> >
> > Sam W.
> >
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> > Yahoo! Groups Links
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8584. Re: [spectrumanalyzer] MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-12 00:34:05 UTC
From: Neganur
Topic: 8572 Message: 8584

I'm interested as well.

Best regards

Chris

On 11 Oct 2011, at 18:00, "Sam" <swetterlin@...> wrote:

> I have done various layouts for a transmission/reflection switch and for a forward/reverse switch. A while ago we did a group board of a "signal router" which contained a relay version of both switches. It worked very well, but the relays are now very hard to find.
>
> I'm now taking a slightly different approach. I believe that the MSA needs an internal Input Switch, which can choose among three inputs: SA, VNA transmission and VNA reflection. I have designed a board that will do this, using edge-launch connectors so it can mount on the front panel with the three input connectors sticking out. The output of the board runs to Mixer 1. This avoids the nightmare of connectors and cables that switches can present. This board replaces the existing MSA Input connector. Any forward/reverse switching would then be done separately in an external box, perhaps with a bridge enclosed.
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> There are actually two alternative versions of the board. They are described at:
> <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_Input_Switch.pdf>
>
> One caveat for those outside the US: In the past I have mailed small boards first class USPS, and they took about one month to arrive at non-US destinations (even Canada). I later tried Priority Mail to Germany, which cost $15 and the package ended up being returned to me with no explanation. So I have bad experience with foreign shipping.
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> One version of the board requires a single 12V G6Z-1F-A relay that is currently available only at Arrow, though they have a huge quantity. I can easily revise the layout to use the G6Z-1FE-A (about US$5.00), which has a slightly different footprint and is more available at Mouser and Arrow. The remainder of the switching is done by several PE4251. That IC is available from Richardson and is incredibly cheap (about US$1.10).
>
> This board will allow a bridge/DUT arrangement to be cabled together and connected to the transmission and reflection inputs, and the MSA will select the proper input when scanning. Switching between SA and VNA is less automated, requiring a hardware switch--not a big deal

since the cabling would be different for the two modes anyway, so some manual intervention is always necessary.
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> It actually will be possible to connect two separate external signals to the "transmission" and "reflection" inputs and use them for SA mode, with automatic switching between them, if that serves any purpose.
>
> Finally, the user can always use the "SA" input for either SA or VNA mode, and ignore the transmission and reflection inputs if desired.
>
> Sam W.
>
>

8585. Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-12 07:54:31 UTC
From: loic
Topic: 8572 Message: 8585

Hi,
You can count on me, generaly sending pcb via usps to France seems reliable through it may take some time ...
regards
Loïc

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have done various layouts for a transmission/reflection switch and for a forward/reverse switch. A while ago we did a group board of a "signal router" which contained a relay version of both switches. It worked very well, but the relays are now very hard to find.
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> This board will allow a bridge/DUT arrangement to be cabled together and connected to the transmission and reflection inputs, and the MSA will select the proper input when scanning.

Switching between SA and VNA is less automated, requiring a hardware switch--not a big deal since the cabling would be different for the two modes anyway, so some manual intervention is always necessary.
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>
> Finally, the user can always use the "SA" input for either SA or VNA mode, and ignore the transmission and reflection inputs if desired.
>
> Sam W.
>

8586. Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-12 08:05:54 UTC
From: Michel
Topic: 8572 Message: 8586

Hi Sam,

+1 please count me in.
I agree with Loïc I've received the pcbs in time (~2/3 weeks for France), any lost mail, UPS has always done the job correctly, up to now...

Thanks.

Michel

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have done various layouts for a transmission/reflection switch and for a forward/reverse switch. A while ago we did a group board of a "signal router" which contained a relay version of both switches. It worked very well, but the relays are now very hard to find.
>
> I'm now taking a slightly different approach. I believe that the MSA needs an internal Input Switch, which can choose among three inputs: SA, VNA transmission and VNA reflection. I have designed a board that will do this, using edge-launch connectors so it can mount on the front panel with the three input connectors sticking out. The output of the board runs to Mixer 1. This avoids the nightmare of connectors and cables that switches can present. This board replaces the existing MSA Input connector. Any forward/reverse switching would then be done separately in an external box, perhaps with a bridge enclosed.
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> Finally, the user can always use the "SA" input for either SA or VNA mode, and ignore the transmission and reflection inputs if desired.
>
> Sam W.
>

8587. Re: [spectrumanalyzer] Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-12 10:02:56 UTC
From: Don Lewis
Topic: 8572 Message: 8587

Loic: Pls, ...I may have missed a thread or two here....

Are you'all again discussing the purchase of a complete set of PWBs for an MSA?

If so, ...how much for a complete set for me in Austin, TX?

Thank you.

Don

==========

From: loic <f6deb@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Wednesday, October 12, 2011 2:54 AM
Subject: [spectrumanalyzer] Re: MSA Input Switch

Hi,
You can count on me, generaly sending pcb via usps to France seems reliable through it may take some time ...
regards
Loïc

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have done various layouts for a transmission/reflection switch and for a forward/reverse switch. A while ago we did a group board of a "signal router" which contained a relay version of both switches. It worked very well, but the relays are now very hard to find.
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> I'm now taking a slightly different approach. I believe that the MSA needs an internal Input Switch, which can choose among three inputs: SA, VNA transmission and VNA reflection. I have designed a board that will do this, using edge-launch connectors so it can mount on the front panel with the three input connectors sticking out. The output of the board runs to Mixer 1. This avoids the nightmare of connectors and cables that switches can present. This board replaces the existing MSA Input connector. Any forward/reverse switching would then be done separately in an external box, perhaps with a bridge enclosed.
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> Finally, the user can always use the "SA" input for either SA or VNA mode, and ignore the transmission and reflection inputs if desired.
>
> Sam W.
>

8588. Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-12 10:59:20 UTC
From: lh1907
Topic: 8572 Message: 8588

Sam,
Add me to your list for one PCB. Thanks.

Larry, W2HHV

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have done various layouts for a transmission/reflection switch and for a forward/reverse switch. A while ago we did a group board of a "signal router" which contained a relay version of both switches. It worked very well, but the relays are now very hard to find.
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>
> Sam W.
>

8589. Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-12 12:53:57 UTC
From: Sam
Topic: 8572 Message: 8589

No, this is just for an input switch which is an add-on to the basic MSA. It's a single board, though I would include several alternative designs since that won't affect the cost much.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Don Lewis <dlewis11193@...> wrote:
>
> Loic:Â Pls, ...I may have missed a thread or two here....
> Â
> Are you'all again discussing the purchase of a complete set of PWBs for an MSA?
> Â
> If so, ...how much for a complete set for me in Austin, TX?
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> Thank you.
> Â
> Don
> Â
> Â
> ==========
>
>
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> From: loic <f6deb@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Wednesday, October 12, 2011 2:54 AM
> Subject: [spectrumanalyzer] Re: MSA Input Switch
>
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>
> Â
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> Hi,
> You can count on me, generaly sending pcb via usps to France seems reliable through it may take some time ...
> regards
> LoÃ¯c
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> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > I have done various layouts for a transmission/reflection switch and for a forward/reverse switch. A while ago we did a group board of a "signal router" which contained a relay version of both switches. It worked very well, but the relays are now very hard to find.
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> > I'm now taking a slightly different approach. I believe that the MSA needs an internal

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> >
> > Sam W.
> >
>

8590. Re: [spectrumanalyzer] Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-12 15:05:11 UTC
From: Robert Fish
Topic: 8572 Message: 8590

Sam,
Please put me down for a board as well.

Bob K6GGO
>
> Sam,
> Add me to your list for one PCB. Thanks.
>
> Larry, W2HHV
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@...> wrote:
> >
> > I have done various layouts for a transmission/reflection switch and
> for a forward/reverse switch. A while ago we did a group board of a
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> worked very well, but the relays are now very hard to find.
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> separately in an external box, perhaps with a bridge enclosed.
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> various versions of the switches, so I expect this board will work
> well. Transmission-Reflection isolation should be at least 120 dB to
> 500 MHz. Above that we'll have to see, but I expect at least 95 dB at
> 1 GHz. It is only about 2" square. I plan to order a few of these. If
> anyone is interested in participating, let me know. Depending what
> boards we end up incorporating, it may cost about $70 plus $15 per
> board set, so the ultimate cost per user depends on the number of
> participants. The boards will not have solder mask or silk-screening.
>
> >
>
>

8591. Re: [spectrumanalyzer] MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-12 16:25:56 UTC
From: Alan Hochhalter
Topic: 8572 Message: 8591

Sam,

I'll sign up to take a board.

Alan

8592. Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-12 19:56:34 UTC
From: seco61
Topic: 8572 Message: 8592

Hi Sam.

I would also like to put my hand up for a PCB.

Like Bill, I have never had any issues with deliveries from the USA via USPS - though the delivery time has varied from 1 week to 3 weeks.

Regards

Gerard (vk3cg/vk3grs)

8593. Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-12 20:27:24 UTC
From: Sam
Topic: 8572 Message: 8593

I suppose I should have directed the responses off-line. Anyone interested, including those who already responded, should send me an email with their mailing address. We definitely have enough interest to make this a "go".

Currently I have a layout with all PE4251 ICs and another that uses the PE4251 plus a single G6Z-1F-A or G6Z-1FE-A relay. The two relays have slightly different footprints but the layout will accommodate either one, requiring the user to cut one trace if the -1F-A is used. I assume most people will choose one version of the layout and just build one board. Personally, I prefer the relay version, though it is a tiny bit bigger.

I am thinking of including an ERA-33SM for the on-board amp, since it is the perfect amp for this purpose and would only cost about $2.50 if I order a bunch. The ERA and PCB should easily fit in a first class padded envelope.

It appears likely that the cost, including ERA, shipping and Paypal fee, will be about $25. These boards are a little more expensive than normal because they contain an incredible number of vias.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have done various layouts for a transmission/reflection switch and for a forward/reverse switch. A while ago we did a group board of a "signal router" which contained a relay version of both switches. It worked very well, but the relays are now very hard to find.
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>
> Sam W.
>

8594. Re: [spectrumanalyzer] MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-13 07:39:20 UTC
From: Jeroen Bastemeijer
Topic: 8572 Message: 8594

Hi Sam,

Please count me in for a board. By the way, never had any problems with "stuff" send from the US to the Netherlands.

Best regards, Jeroen PE1RGE

On 10/11/2011 05:00 PM, Sam wrote:
>
> I have done various layouts for a transmission/reflection switch and
> for a forward/reverse switch. A while ago we did a group board of a
> "signal router" which contained a relay version of both switches. It
> worked very well, but the relays are now very hard to find.
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> which has a slightly different footprint and is more available at
> Mouser and Arrow. The remainder of the switching is done by several
> PE4251. That IC is available from Richardson and is incredibly cheap
> (about US$1.10).
>
> This board will allow a bridge/DUT arrangement to be cabled together
> and connected to the transmission and reflection inputs, and the MSA
> will select the proper input when scanning. Switching between SA and
> VNA is less automated, requiring a hardware switch--not a big deal
> since the cabling would be different for the two modes anyway, so some
> manual intervention is always necessary.
>
> It actually will be possible to connect two separate external signals
> to the "transmission" and "reflection" inputs and use them for SA
> mode, with automatic switching between them, if that serves any purpose.
>
> Finally, the user can always use the "SA" input for either SA or VNA
> mode, and ignore the transmission and reflection inputs if desired.
>
> Sam W.
>
>

8595. Re: [spectrumanalyzer] MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-13 17:48:04 UTC
From: Randall White
Topic: 8572 Message: 8595

Hi Sam,

Could you mark me down for a board as well?

Thanks,
Randall

On Thu, Oct 13, 2011 at 12:39 AM, Jeroen Bastemeijer <
j.bastemeijer@...> wrote:

> **
>
>
> Hi Sam,
>
> Please count me in for a board. By the way, never had any problems with
> "stuff" send from the US to the Netherlands.
>
> Best regards, Jeroen PE1RGE
>
>
> On 10/11/2011 05:00 PM, Sam wrote:
>
>
>
> I have done various layouts for a transmission/reflection switch and for a
> forward/reverse switch. A while ago we did a group board of a "signal
> router" which contained a relay version of both switches. It worked very
> well, but the relays are now very hard to find.
>
> I'm now taking a slightly different approach. I believe that the MSA needs
> an internal Input Switch, which can choose among three inputs: SA, VNA
> transmission and VNA reflection. I have designed a board that will do this,
> using edge-launch connectors so it can mount on the front panel with the
> three input connectors sticking out. The output of the board runs to Mixer
> 1. This avoids the nightmare of connectors and cables that switches can
> present. This board replaces the existing MSA Input connector. Any
> forward/reverse switching would then be done separately in an external box,
> perhaps with a bridge enclosed.
>
> I haven't built this particular board, but Lin and I have tested various
> versions of the switches, so I expect this board will work well.
> Transmission-Reflection isolation should be at least 120 dB to 500 MHz.
> Above that we'll have to see, but I expect at least 95 dB at 1 GHz. It is
> only about 2" square. I plan to order a few of these. If anyone is
> interested in participating, let me know. Depending what boards we end up

> incorporating, it may cost about $70 plus $15 per board set, so the ultimate
> cost per user depends on the number of participants. The boards will not
> have solder mask or silk-screening.
>
> There are actually two alternative versions of the board. They are
> described at:
> <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_Input_Switch.pdf
> >
>
> One caveat for those outside the US: In the past I have mailed small boards
> first class USPS, and they took about one month to arrive at non-US
> destinations (even Canada). I later tried Priority Mail to Germany, which
> cost $15 and the package ended up being returned to me with no explanation.
> So I have bad experience with foreign shipping.
>
> One version of the board requires a single 12V G6Z-1F-A relay that is
> currently available only at Arrow, though they have a huge quantity. I can
> easily revise the layout to use the G6Z-1FE-A (about US$5.00), which has a
> slightly different footprint and is more available at Mouser and Arrow. The
> remainder of the switching is done by several PE4251. That IC is available
> from Richardson and is incredibly cheap (about US$1.10).
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> This board will allow a bridge/DUT arrangement to be cabled together and
> connected to the transmission and reflection inputs, and the MSA will select
> the proper input when scanning. Switching between SA and VNA is less
> automated, requiring a hardware switch--not a big deal since the cabling
> would be different for the two modes anyway, so some manual intervention is
> always necessary.
>
> It actually will be possible to connect two separate external signals to
> the "transmission" and "reflection" inputs and use them for SA mode, with
> automatic switching between them, if that serves any purpose.
>
> Finally, the user can always use the "SA" input for either SA or VNA mode,
> and ignore the transmission and reflection inputs if desired.
>
> Sam W.
>
>
>
>
>

8596. Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-14 00:13:58 UTC
From: Sam
Topic: 8572 Message: 8596

Again, to sign up please send me your address offline.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Randall White <randall.m.white@...> wrote:
>
> Hi Sam,
>
> Could you mark me down for a board as well?
>
> Thanks,
> Randall
>
> On Thu, Oct 13, 2011 at 12:39 AM, Jeroen Bastemeijer <
> j.bastemeijer@...> wrote:
>
> > **
> >
> >
> > Hi Sam,
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> > Please count me in for a board. By the way, never had any problems with
> > "stuff" send from the US to the Netherlands.
> >
> > Best regards, Jeroen PE1RGE
> >
> >
> > On 10/11/2011 05:00 PM, Sam wrote:
> >
> >
> >
> > I have done various layouts for a transmission/reflection switch and for a
> > forward/reverse switch. A while ago we did a group board of a "signal
> > router" which contained a relay version of both switches. It worked very
> > well, but the relays are now very hard to find.
> >
> > I'm now taking a slightly different approach. I believe that the MSA needs
> > an internal Input Switch, which can choose among three inputs: SA, VNA
> > transmission and VNA reflection. I have designed a board that will do this,
> > using edge-launch connectors so it can mount on the front panel with the
> > three input connectors sticking out. The output of the board runs to Mixer
> > 1. This avoids the nightmare of connectors and cables that switches can
> > present. This board replaces the existing MSA Input connector. Any
> > forward/reverse switching would then be done separately in an external box,
> > perhaps with a bridge enclosed.
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> > I haven't built this particular board, but Lin and I have tested various
> > versions of the switches, so I expect this board will work well.
> > Transmission-Reflection isolation should be at least 120 dB to 500 MHz.
> > Above that we'll have to see, but I expect at least 95 dB at 1 GHz. It is
> > only about 2" square. I plan to order a few of these. If anyone is
> > interested in participating, let me know. Depending what boards we end up
> > incorporating, it may cost about $70 plus $15 per board set, so the ultimate
> > cost per user depends on the number of participants. The boards will not
> > have solder mask or silk-screening.
> >
> > There are actually two alternative versions of the board. They are
> > described at:
> > <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_Input_Switch.pdf
> > >
> >
> > One caveat for those outside the US: In the past I have mailed small boards
> > first class USPS, and they took about one month to arrive at non-US
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> > One version of the board requires a single 12V G6Z-1F-A relay that is
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> > slightly different footprint and is more available at Mouser and Arrow. The
> > remainder of the switching is done by several PE4251. That IC is available
> > from Richardson and is incredibly cheap (about US$1.10).
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> > This board will allow a bridge/DUT arrangement to be cabled together and
> > connected to the transmission and reflection inputs, and the MSA will select
> > the proper input when scanning. Switching between SA and VNA is less
> > automated, requiring a hardware switch--not a big deal since the cabling
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> > automatic switching between them, if that serves any purpose.
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> > Finally, the user can always use the "SA" input for either SA or VNA mode,
> > and ignore the transmission and reflection inputs if desired.
> >
> > Sam W.
> >
> >
> >
> >
> >
>

8597. Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-14 01:34:26 UTC
From: Sam
Topic: 8572 Message: 8597

I have decided to add a Forward/Reverse (F/R) switch to the board. This contains four PE4251 switches, and actually can be configured for all sorts of switching uses, by changing the coax connections. As an F/R switch, it runs the test signal forward or backward through the DUT for testing in either direction. Unlike the Input Switch, which I view as internal to the MSA, the F/R switch in my vision would be external, perhaps combined with a directional coupler.

The amount of interest is sufficient that even with this additional circuit the cost per board will be close to my original estimate. Kudos to Australia for keeping the interest up!

These exact circuits have not yet been built, but I have spent considerable time designing and testing related circuits, and I also want to acknowledge the great cooperation of Lincheng Xiu (Lin), who when not rollerblading has done a great job of design review, construction and testing.

A reminder: if you don't send me your address by email, I can't count you as on board.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Again, to sign up please send me your address offline.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Randall White <randall.m.white@> wrote:
> >
> > Hi Sam,
> >
> > Could you mark me down for a board as well?
> >
> > Thanks,
> > Randall
> >
> > On Thu, Oct 13, 2011 at 12:39 AM, Jeroen Bastemeijer <
> > j.bastemeijer@> wrote:
> >
> > > **
> > >
> > >
> > > Hi Sam,
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> > > Please count me in for a board. By the way, never had any problems with
> > > "stuff" send from the US to the Netherlands.
> > >
> > > Best regards, Jeroen PE1RGE

> > >
> > >
> > > On 10/11/2011 05:00 PM, Sam wrote:
> > >
> > >
> > >
> > > I have done various layouts for a transmission/reflection switch and for a
> > > forward/reverse switch. A while ago we did a group board of a "signal
> > > router" which contained a relay version of both switches. It worked very
> > > well, but the relays are now very hard to find.
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> > > I'm now taking a slightly different approach. I believe that the MSA needs
> > > an internal Input Switch, which can choose among three inputs: SA, VNA
> > > transmission and VNA reflection. I have designed a board that will do this,
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> > > forward/reverse switching would then be done separately in an external box,
> > > perhaps with a bridge enclosed.
> > >
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> > > Transmission-Reflection isolation should be at least 120 dB to 500 MHz.
> > > Above that we'll have to see, but I expect at least 95 dB at 1 GHz. It is
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> > > interested in participating, let me know. Depending what boards we end up
> > > incorporating, it may cost about $70 plus $15 per board set, so the ultimate
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> > > There are actually two alternative versions of the board. They are
> > > described at:
> > > <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_Input_Switch.pdf
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> > >
> > > One caveat for those outside the US: In the past I have mailed small boards
> > > first class USPS, and they took about one month to arrive at non-US
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> > > cost $15 and the package ended up being returned to me with no explanation.
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> > > remainder of the switching is done by several PE4251. That IC is available
> > > from Richardson and is incredibly cheap (about US$1.10).
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> > > This board will allow a bridge/DUT arrangement to be cabled together and

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> > > Finally, the user can always use the "SA" input for either SA or VNA mode,
> > > and ignore the transmission and reflection inputs if desired.
> > >
> > > Sam W.
> > >
> > >
> > >
> > >
> > >
> >
>

8598. USB Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-14 12:15:54 UTC
From: Eric Nystrom
Topic: 8598 Message: 8598

I am trying to get the USB interface to the MSA working. I have one of the

EZ USB boards from eBay and have successfully installed the drivers
and firmware. I have checked the outputs with a logic analyzer and everything
seems to be working. Outputs start when the MSA is run and stop when it
stops.

I am having trouble getting but zero readings from the A to D converter.
I tried a test with the board not connected to the MSA. I put a pull up tied to
3.3 v on PA4 and PA5. When I look at show variables, I get a reading of all zeros
for the Mag and Phase inputs.

Any ideas?

Eric Nystrom

8599. Re: USB Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-14 13:43:00 UTC
From: david529007
Topic: 8598 Message: 8599

first try forcing the input high and make sure you get all 1's out but don't destroy the ADC output line driver in doing so. Then put a scope on the acd control lines and make sure they clock correctly. You wil find logic analyser trace examples in the files area of the group

Dave

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> I am trying to get the USB interface to the MSA working. I have one of the
>
> EZ USB boards from eBay and have successfully installed the drivers
> and firmware. I have checked the outputs with a logic analyzer and everything
> seems to be working. Outputs start when the MSA is run and stop when it
> stops.
>
>
> I am having trouble getting but zero readings from the A to D converter.
> I tried a test with the board not connected to the MSA. I put a pull up tied to
> 3.3 v on PA4 and PA5. When I look at show variables, I get a reading of all zeros
> for the Mag and Phase inputs.
>
> Any ideas?
>
>
> Eric Nystrom
>

8600. Re: [spectrumanalyzer] Re: USB Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-14 14:44:24 UTC
From: Eric Nystrom
Topic: 8598 Message: 8600

Dave,

Thanks for the reply.

I did force the input high with a pullup and still read all zeros in the MSA software. I checked
the ADC control lines and they are correct according to your document. I still need to make

some updates to my ADC board to change the drivers and put the correct pullups on so that
I can use it with the USB board.

Eric Nystrom

From: david529007 <dave.roberts@btinternet.com>
To: spectrumanalyzer@yahoogroups.com
Sent: Friday, October 14, 2011 9:43 AM
Subject: [spectrumanalyzer] Re: USB Debugging

first try forcing the input high and make sure you get all 1's out but don't destroy the
ADC output line driver in doing so. Then put a scope on the acd control lines and make sure
they clock correctly. You wil find logic analyser trace examples in the files area of the
group

Dave

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> I am trying to get the USB interface to the MSA working. I have one of the
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> EZ USB boards from eBay and have successfully installed the drivers
> and firmware. I have checked the outputs with a logic analyzer and everything
> seems to be working. Outputs start when the MSA is run and stop when it
> stops.
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> I am having trouble getting but zero readings from the A to D converter.
> I tried a test with the board not connected to the MSA. I put a pull up tied to
> 3.3 v on PA4 and PA5. When I look at show variables, I get a reading of all zeros
> for the Mag and Phase inputs.
>
> Any ideas?
>
>
> Eric Nystrom
>

8603. Input Switch and F/R Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-14 21:30:48 UTC
From: Sam
Topic: 8603 Message: 8603

I have updated the description of the Input Switch:
<http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_Input_Switch.pdf>

I have also added a description of the Forward/Reverse Switch, which has been added to the group buy board:
<http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_FR_Switch_PE4251.pdf>

There are now about 30 participants, far more than I anticipated. I have an offer from the UK to handle the European distribution, which will be helpful. If someone could do Australia/New Zealand, that would also help. I am considering including the PE4251s for non-US buyers, because they are apparently awkward to acquire in many areas; that would only add about $6 to the cost. I thought about doing the same with the relay but that would mess up my simple shipping concept (first class padded envelope). But with a "local distributor" I could send a bigger package to that person and even do a customs form all legal-like.

Sam W.

8604. Re: [spectrumanalyzer] Input Switch and F/R Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-15 00:16:13 UTC
From: Bill Maxwell
Topic: 8603 Message: 8604

I would be happy to handle VK/ZL shipments Sam, unless another VK slightly more centrally located steps forward. Not that the postage rates are likely to vary much within VK.

Bill VK7MX

On 15/10/2011 8:30 AM, Sam wrote:
> I have updated the description of the Input Switch:
> <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_Input_Switch.pdf>
>
> I have also added a description of the Forward/Reverse Switch, which has been added to the group buy board:
> <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_FR_Switch_PE4251.pdf>
>
> There are now about 30 participants, far more than I anticipated. I have an offer from the UK to handle the European distribution, which will be helpful. If someone could do Australia/New Zealand, that would also help. I am considering including the PE4251s for non-US buyers, because they are apparently awkward to acquire in many areas; that would only add about $6 to the cost. I thought about doing the same with the relay but that would mess up my simple shipping concept (first class padded envelope). But with a "local distributor" I could send a bigger package to that person and even do a customs form all legal-like.
>
> Sam W.
>
>
>
> ----------
>
> Yahoo! Groups Links
>
>
>
>

I use BullGuard Spamfilter to keep my inbox clean.
It is completely free: www.bullguard.com/freespamfilter

8605. Re: [spectrumanalyzer] Re: USB Debugging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-15 00:33:20 UTC
From: Jim Hontoria
Topic: 8598 Message: 8605

Hi Eric,
The ADC pullups for the MUN2211 buffers are located in the Control board, so when you disconnect from it you lose the pullups. That would explain why you are getting 0 volts. You should be abble to place 10k pullups on the ADC board although it takes some calistenics. The Cypress chip will tolerate 5 volts output from the buffers.

Jim

On Fri, Oct 14, 2011 at 10:44 AM, Eric Nystrom <gloimon@...> wrote:

> **
>
>
> Dave,
>
> Thanks for the reply.
>
> I did force the input high with a pullup and still read all zeros in the
> MSA software. I checked
> the ADC control lines and they are correct according to your document. I
> still need to make
> some updates to my ADC board to change the drivers and put the correct
> pullups on so that
> I can use it with the USB board.
>
> Eric Nystrom
> ----------
> *From:* david529007 <dave.roberts@...>
> *To:* spectrumanalyzer@yahoogroups.com
> *Sent:* Friday, October 14, 2011 9:43 AM
> *Subject:* [spectrumanalyzer] Re: USB Debugging
>
>
> first try forcing the input high and make sure you get all 1's out but
> don't destroy the ADC output line driver in doing so. Then put a scope on
> the acd control lines and make sure they clock correctly. You wil find logic
> analyser trace examples in the files area of the group
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> Dave
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> --- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
> >
> > I am trying to get the USB interface to the MSA working. I have one of
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> > EZ USB boards from eBay and have successfully installed the drivers
> > and firmware. I have checked the outputs with a logic analyzer and
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> > I am having trouble getting but zero readings from the A to D converter.
> > I tried a test with the board not connected to the MSA. I put a pull up
> tied to
> > 3.3 v on PA4 and PA5. When I look at show variables, I get a reading of
> all zeros
> > for the Mag and Phase inputs.
> >
> > Any ideas?
> >
> >
> > Eric Nystrom
> >
>
>
>
>
>

--
Jim G. Hontoria

8606. Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-15 06:58:19 UTC
From: Rex Pearson
Topic: 8572 Message: 8606

Hi Sam

Tried to send you an email about a set of boards and get a mail bounce.

Are you having any known problems with mail

Rex

This is an automatically generated Delivery Status Notification.

THIS IS A WARNING MESSAGE ONLY.

YOU DO NOT NEED TO RESEND YOUR MESSAGE.

Delivery to the following recipients has been delayed.

<swetterlin@...>

The reason for the problem:

4.3.2 - Not accepting messages at this time
554-'imta03.emeryville.ca.mail.comcast.net comcast 150.101.137.143 Comcast
block for spam. Please see http://help.comcast.net/content/faq/BL000000 '

8607. Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-15 11:50:05 UTC
From: Sam
Topic: 8572 Message: 8607

Rex,
Comcast blocks emails from ISPs known to generate a lot of spam; your provider must be on their list. I've only had one prior problem with legitimate email. You can post your address here if you want and I'll copy the address and delete the message.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Rex Pearson" <r.pearson@...> wrote:
>
> Hi Sam
>
>
>
> Tried to send you an email about a set of boards and get a mail bounce.
>
>
>
> Are you having any known problems with mail
>
>
>
> Rex
>
> ---
> ---
>
> This is an automatically generated Delivery Status Notification.
>
>
>
> THIS IS A WARNING MESSAGE ONLY.
>
>
>
> YOU DO NOT NEED TO RESEND YOUR MESSAGE.
>
>
>
> Delivery to the following recipients has been delayed.
>
>
>
> <swetterlin@...>
>
>
>

```
> The reason for the problem:
>
> 4.3.2 - Not accepting messages at this time
> 554-'imta03.emeryville.ca.mail.comcast.net comcast 150.101.137.143 Comcast
> block for spam. Please see http://help.comcast.net/content/faq/BL000000 '
>
> ----------------------------------------------------------------
>
```

8608. Re: Input Switch and F/R Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-15 11:53:59 UTC
From: Sam
Topic: 8603 Message: 8608

Bill,
Thanks, that will be a big help. I will contact you in a couple of days.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Bill Maxwell <wrmaxwell@...> wrote:
>
> I would be happy to handle VK/ZL shipments Sam, unless another VK
> slightly more centrally located steps forward. Not that the postage
> rates are likely to vary much within VK.
>
> Bill VK7MX
>
> On 15/10/2011 8:30 AM, Sam wrote:
> > I have updated the description of the Input Switch:
> > <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_Input_Switch.pdf>
> >
> > I have also added a description of the Forward/Reverse Switch, which has been added to
the group buy board:
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> > There are now about 30 participants, far more than I anticipated. I have an offer from
the UK to handle the European distribution, which will be helpful. If someone could do
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non-US buyers, because they are apparently awkward to acquire in many areas; that would
only add about $6 to the cost. I thought about doing the same with the relay but that would
mess up my simple shipping concept (first class padded envelope). But with a "local
distributor" I could send a bigger package to that person and even do a customs form all
legal-like.
> >
> > Sam W.
> >
> >
> >
> > ------------------------------------
> >
> > Yahoo! Groups Links
> >
> >
> >
> >
>
>
>
> I use BullGuard Spamfilter to keep my inbox clean.
> It is completely free: www.bullguard.com/freespamfilter

>

8609. Re: Input Switch and F/R Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-15 13:24:43 UTC
From: Sam
Topic: 8603 Message: 8609

I have just sent an email to everyone on my list. If you think you are on the list but don't get the email, let me know. I could easily have dropped a name or messed up the email address. This is a bit of an administrative challenge.

If you haven't signed up but want to, I'll accept more names through the end of Sunday, U.S. Central Standard Time. As of now we are at 35 participants, half U.S. and half non-U.S.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Bill,
> Thanks, that will be a big help. I will contact you in a couple of days.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Bill Maxwell <wrmaxwell@> wrote:
> >
> > I would be happy to handle VK/ZL shipments Sam, unless another VK
> > slightly more centrally located steps forward. Not that the postage
> > rates are likely to vary much within VK.
> >
> > Bill VK7MX
> >
> > On 15/10/2011 8:30 AM, Sam wrote:
> > > I have updated the description of the Input Switch:
> > > <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_Input_Switch.pdf>
> > >
> > > I have also added a description of the Forward/Reverse Switch, which has been added to the group buy board:
> > > <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_FR_Switch_PE4251.pdf>
> > >
> > > There are now about 30 participants, far more than I anticipated. I have an offer from the UK to handle the European distribution, which will be helpful. If someone could do Australia/New Zealand, that would also help. I am considering including the PE4251s for non-US buyers, because they are apparently awkward to acquire in many areas; that would only add about $6 to the cost. I thought about doing the same with the relay but that would mess up my simple shipping concept (first class padded envelope). But with a "local distributor" I could send a bigger package to that person and even do a customs form all legal-like.
> > >
> > > Sam W.
> > >
> > >
> > >
> > > ----------

> > >
> > > Yahoo! Groups Links
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> >
> >
> >
> > I use BullGuard Spamfilter to keep my inbox clean.
> > It is completely free: www.bullguard.com/freespamfilter
> >
>

8610. Re: [spectrumanalyzer] Re: Input Switch and F/R Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-15 20:28:44 UTC
From: J Varkevisser
Topic: 8603 Message: 8610

Hi Sam,
Could you mark me down for a board as well?
Thanks,
JAN PA0JRV
PA0JRV@...

8611. Re: Input Switch and F/R Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-15 22:10:53 UTC
From: Sam
Topic: 8603 Message: 8611

Please send me an email with your address.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, J Varkevisser <sp366922@...> wrote:
>
> Hi Sam,
> Could you mark me down for a board as well?
> Thanks,
> JAN PA0JRV
> PA0JRV@...
>

8613. Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-15 22:58:49 UTC
From: Sam
Topic: 8572 Message: 8613

OK. Address received and I deleted the message.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Rex Pearson" <r.pearson@...> wrote:
>
> Hi Sam
>
>
>
> I will contact Internode and advise them to deal with Comcast. Internode
> are one of the best ISP's in Australia and have a good reputation.
>
>
>
> Address is:
>....
> Rex
>

8614. Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-16 12:54:53 UTC
From: lh1907
Topic: 8572 Message: 8614

Sam,
I did not receive an e-mail from you but still would like to buy one of these PCBs. Thanks.

Larry, W2HHV

--- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@...> wrote:
>
> Sam,
> Add me to your list for one PCB. Thanks.
>
> Larry, W2HHV
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > I have done various layouts for a transmission/reflection switch and for a forward/reverse switch. A while ago we did a group board of a "signal router" which contained a relay version of both switches. It worked very well, but the relays are now very hard to find.
> >
> > I'm now taking a slightly different approach. I believe that the MSA needs an internal Input Switch, which can choose among three inputs: SA, VNA transmission and VNA reflection. I have designed a board that will do this, using edge-launch connectors so it can mount on the front panel with the three input connectors sticking out. The output of the board runs to Mixer 1. This avoids the nightmare of connectors and cables that switches can present. This board replaces the existing MSA Input connector. Any forward/reverse switching would then be done separately in an external box, perhaps with a bridge enclosed.
> >
> > I haven't built this particular board, but Lin and I have tested various versions of the switches, so I expect this board will work well. Transmission-Reflection isolation should be at least 120 dB to 500 MHz. Above that we'll have to see, but I expect at least 95 dB at 1 GHz. It is only about 2" square. I plan to order a few of these. If anyone is interested in participating, let me know. Depending what boards we end up incorporating, it may cost about $70 plus $15 per board set, so the ultimate cost per user depends on the number of participants. The boards will not have solder mask or silk-screening.
> >
> > There are actually two alternative versions of the board. They are described at:
> > <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_Input_Switch.pdf>
> >
> > One caveat for those outside the US: In the past I have mailed small boards first class USPS, and they took about one month to arrive at non-US destinations (even Canada). I later tried Priority Mail to Germany, which cost $15 and the package ended up being returned to me with no explanation. So I have bad experience with foreign shipping.
> >
> > One version of the board requires a single 12V G6Z-1F-A relay that is currently available only at Arrow, though they have a huge quantity. I can easily revise the layout to use the G6Z-1FE-A (about US$5.00), which has a slightly different footprint and is more

available at Mouser and Arrow. The remainder of the switching is done by several PE4251. That IC is available from Richardson and is incredibly cheap (about US$1.10).
> >
> > This board will allow a bridge/DUT arrangement to be cabled together and connected to the transmission and reflection inputs, and the MSA will select the proper input when scanning. Switching between SA and VNA is less automated, requiring a hardware switch--not a big deal since the cabling would be different for the two modes anyway, so some manual intervention is always necessary.
> >
> > It actually will be possible to connect two separate external signals to the "transmission" and "reflection" inputs and use them for SA mode, with automatic switching between them, if that serves any purpose.
> >
> > Finally, the user can always use the "SA" input for either SA or VNA mode, and ignore the transmission and reflection inputs if desired.
> >
> > Sam W.
> >
>

8615. Re: MSA Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-16 13:05:20 UTC
From: Sam
Topic: 8572 Message: 8615

I've now added you to the list but please email your mailing address. I have been compiling my list only from emails.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@...> wrote:
>
>
> Sam,
> I did not receive an e-mail from you but still would like to buy one of these PCBs. Thanks.
>
> Larry, W2HHV
>
> --- In spectrumanalyzer@yahoogroups.com, "lh1907" <llh5@> wrote:
> >
> > Sam,
> > Add me to your list for one PCB. Thanks.
> >
> > Larry, W2HHV
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > I have done various layouts for a transmission/reflection switch and for a forward/reverse switch. A while ago we did a group board of a "signal router" which contained a relay version of both switches. It worked very well, but the relays are now very hard to find.
> > >
> > > I'm now taking a slightly different approach. I believe that the MSA needs an internal Input Switch, which can choose among three inputs: SA, VNA transmission and VNA reflection. I have designed a board that will do this, using edge-launch connectors so it can mount on the front panel with the three input connectors sticking out. The output of the board runs to Mixer 1. This avoids the nightmare of connectors and cables that switches can present. This board replaces the existing MSA Input connector. Any forward/reverse switching would then be done separately in an external box, perhaps with a bridge enclosed.
> > >
> > > I haven't built this particular board, but Lin and I have tested various versions of the switches, so I expect this board will work well. Transmission-Reflection isolation should be at least 120 dB to 500 MHz. Above that we'll have to see, but I expect at least 95 dB at 1 GHz. It is only about 2" square. I plan to order a few of these. If anyone is interested in participating, let me know. Depending what boards we end up incorporating, it may cost about $70 plus $15 per board set, so the ultimate cost per user depends on the number of participants. The boards will not have solder mask or silk-screening.
> > >
> > > There are actually two alternative versions of the board. They are described at:
> > > <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_Input_Switch.pdf>
> > >

> > > One caveat for those outside the US: In the past I have mailed small boards first class USPS, and they took about one month to arrive at non-US destinations (even Canada). I later tried Priority Mail to Germany, which cost $15 and the package ended up being returned to me with no explanation. So I have bad experience with foreign shipping.
> > >
> > > One version of the board requires a single 12V G6Z-1F-A relay that is currently available only at Arrow, though they have a huge quantity. I can easily revise the layout to use the G6Z-1FE-A (about US$5.00), which has a slightly different footprint and is more available at Mouser and Arrow. The remainder of the switching is done by several PE4251. That IC is available from Richardson and is incredibly cheap (about US$1.10).
> > >
> > > This board will allow a bridge/DUT arrangement to be cabled together and connected to the transmission and reflection inputs, and the MSA will select the proper input when scanning. Switching between SA and VNA is less automated, requiring a hardware switch--not a big deal since the cabling would be different for the two modes anyway, so some manual intervention is always necessary.
> > >
> > > It actually will be possible to connect two separate external signals to the "transmission" and "reflection" inputs and use them for SA mode, with automatic switching between them, if that serves any purpose.
> > >
> > > Finally, the user can always use the "SA" input for either SA or VNA mode, and ignore the transmission and reflection inputs if desired.
> > >
> > > Sam W.
> > >
> >
>

8616. Re: Input Switch and F/R Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-16 16:58:59 UTC
From: Sam
Topic: 8603 Message: 8616

Here is the current plan. This is preliminary, so DON'T SEND MONEY YET.

For U.S. participants, the package will include one PCB and one ERA-33SM. Relay and PE4251's are not included. The PE4251 can easily be bought from rell.com. The relay can be bought from Mouser, Newark or Arrow. The cost will be $25.00 including shipping and Paypal fee.

For non-US participants, the above package will be provided plus 10 PE4251s and one G6Z-1-FE-A-12DC relay. The additional cost will be $21 for the extra parts; we still have to figure out shipping cost. We can't customize these orders because it will become a nightmare.

For Australia/New Zealand, I will ship to Bill Maxwell who will redistribute. For Europe, I will ship to Reid Campbell (UK). Those shipments will be by Priority Mail, so hopefully they will be speedy. It will somewhat pricey for each of those shipments, but that cost gets spread over 8-10 people.

Summary: I think this is where we will end up:

US Participants--$25 for PCB and ERA-33SM.

Australia/New Zealand/Europe--$46 for PCB, ERA-33SM, 10 PE4251s and one relay, plus cost of shipping from the "local distributor".

Other non-US--$46 for PCB, ERA-33SM, 10 PE4251s and one relay, plus cost of shipping from US if it is over a couple bucks.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have updated the description of the Input Switch:
> <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_Input_Switch.pdf>
>
> I have also added a description of the Forward/Reverse Switch, which has been added to the group buy board:
> <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_FR_Switch_PE4251.pdf>
>
> There are now about 30 participants, far more than I anticipated. I have an offer from the UK to handle the European distribution, which will be helpful. If someone could do Australia/New Zealand, that would also help. I am considering including the PE4251s for non-US buyers, because they are apparently awkward to acquire in many areas; that would only add about $6 to the cost. I thought about doing the same with the relay but that would mess up my simple shipping concept (first class padded envelope). But with a "local distributor" I could send a bigger package to that person and even do a customs form all legal-like.
>

> Sam W.
>

8617. Re: DDS U3 current

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-17 04:00:36 UTC
From: neganur
Topic: 7133 Message: 8617

I was testing my DDS1 and DDS3 last night and encountered something similar. My U3 is NC7SZ04M5XCT-ND from Digi-Key.

DDS 1 Test (log detector connected to J4 with DC block):

1. Voltage at P1-2 = 9.96 V (+10 V +/- 0.1 V)
2. Voltage at U1-1 = 9.30 V
3. U1-3, U2-6, U2-11, U2-18, and U2-23 = 4.93 V (+5.0 V +/- 0.1 V)
4. U3-5 = 4.78 V (should be 30 mV lower than U1-3)
5. U3-2 = 2.40 V (It should be +2.5 volts, +/- .1 volts)
6. U2-3 and U2-4 = 4.92 V
7 U2-1, U2-2, U2-26, U2-27 and U2-28 = 0 V
8. U2-12 = 1.268 (should be +1.248 volts, +/- .01 volts)

DDS 1 Test (J4 floating):

1. Voltage at P1-2 = 9.96 V (+10 V +/- 0.1 V)
2. Voltage at U1-1 = 9.39 V
3. U1-3, U2-6, U2-11, U2-18, and U2-23 = 4.93 V (+5.0 V +/- 0.1 V)
4. U3-5 = 4.88 V (should be 30 mV lower than U1-3)
5. U3-2 = 2.448 V (It should be +2.5 volts, +/- .1 volts)
6. U2-3 and U2-4 = 4.93 V
7. U2-1, U2-2, U2-26, U2-27 and U2-28 = 0 V
8. 1.267 (should be +1.248 volts, +/- .01 volts)

With load: 15 mA
Without load: 5mA

I wonder if the voltages denoted in the DDS Module Test are for an unloaded Log Detector. Although the test specification asks to connect J4 to it via the DC block.

By the way,

" Run the MSA Program. The MSA Main Graph will open and sweep with the MSA in the Spectrum Analyzer mode."

Ver116, RevF doesn't do this. I have do select Mode->Spectrum Analyzer before it shows anything.

I repeated the test with DDS 3:

DDS 3 Test (log detector connected to J4 with DC block):

1. Voltage at P1-2 = 9.96 V (+10 V +/- 0.1 V)
2. Voltage at U1-1 = 9.28 V
3. U1-3, U2-6, U2-11, U2-18, and U2-23 = 4.93 V (+5.0 V +/- 0.1 V)
4. U3-5 = 4.78 V (should be 30 mV lower than U1-3)
5. U3-2 = 2.40 V (It should be +2.5 volts, +/- .1 volts)

6. U2-3 and U2-4 = 4.92 V
7 U2-1, U2-2, U2-26, U2-27 and U2-28 = 0 V
8. U2-12 = 1.260 (should be +1.248 volts, +/- .01 volts)

DDS 1 Test (J4 floating):

1. Voltage at P1-2 = 9.96 V (+10 V +/- 0.1 V)
2. Voltage at U1-1 = 9.39 V
3. U1-3, U2-6, U2-11, U2-18, and U2-23 = 4.93 V (+5.0 V +/- 0.1 V)
4. U3-5 = 4.88 V (should be 30 mV lower than U1-3)
5. U3-2 = 2.448 V (It should be +2.5 volts, +/- .1 volts)
6. U2-3 and U2-4 = 4.93 V
7. U2-1, U2-2, U2-26, U2-27 and U2-28 = 0 V
8. 1.267 (should be +1.248 volts, +/- .01 volts)

With load: 15 mA
Without load: 5mA

Best regards

Chris

--- In spectrumanalyzer@...m, "Sam" <swetterlin@...> wrote:
>
> I don't know that the extra 10 mA causes any problem, but the static current draw should only be a few uA.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Here is what I did for this troubleshooting:
> > 1) Disconnect the load: Drops from 20mA to 13mA
> > 2) Remove R14 (33 ohm): Drops from 13mA to 11mA
> > 3) Remove R10 (100kohm): Drops from 11mA to 10.3mA
> > No short, the output stays at logic high 5V.
> >
> > Looks like the IC needs 10.3mA even it is in static state.
> >
> > Lin
> >

8618. Re: Input Switch and F/R Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-17 12:19:30 UTC
From: Sam
Topic: 8603 Message: 8618

We have now passed the cutoff point for joining. I have sent an email to everyone now on the list, so if you think you are on the list but do not get an email, contact me by email. Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Here is the current plan. This is preliminary, so DON'T SEND MONEY YET.
>
> For U.S. participants, the package will include one PCB and one ERA-33SM. Relay and PE4251's are not included. The PE4251 can easily be bought from rell.com. The relay can be bought from Mouser, Newark or Arrow. The cost will be $25.00 including shipping and Paypal fee.
>
> For non-US participants, the above package will be provided plus 10 PE4251s and one G6Z-1-FE-A-12DC relay. The additional cost will be $21 for the extra parts; we still have to figure out shipping cost. We can't customize these orders because it will become a nightmare.
>
> For Australia/New Zealand, I will ship to Bill Maxwell who will redistribute. For Europe, I will ship to Reid Campbell (UK). Those shipments will be by Priority Mail, so hopefully they will be speedy. It will somewhat pricey for each of those shipments, but that cost gets spread over 8-10 people.
>
> Summary: I think this is where we will end up:
>
> US Participants--$25 for PCB and ERA-33SM.
>
> Australia/New Zealand/Europe--$46 for PCB, ERA-33SM, 10 PE4251s and one relay, plus cost of shipping from the "local distributor".
>
> Other non-US--$46 for PCB, ERA-33SM, 10 PE4251s and one relay, plus cost of shipping from US if it is over a couple bucks.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > I have updated the description of the Input Switch:
> > <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_Input_Switch.pdf>
> >
> > I have also added a description of the Forward/Reverse Switch, which has been added to the group buy board:
> > <http://groups.yahoo.com/group/spectrumanalyzer/files/MSA_FR_Switch_PE4251.pdf>
> >
> > There are now about 30 participants, far more than I anticipated. I have an offer from

the UK to handle the European distribution, which will be helpful. If someone could do Australia/New Zealand, that would also help. I am considering including the PE4251s for non-US buyers, because they are apparently awkward to acquire in many areas; that would only add about $6 to the cost. I thought about doing the same with the relay but that would mess up my simple shipping concept (first class padded envelope). But with a "local distributor" I could send a bigger package to that person and even do a customs form all legal-like.
> >
> > Sam W.
> >
>

8619. Re: [spectrumanalyzer] Re: DDS U3 current

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-17 13:45:26 UTC
From: william sprowls
Topic: 7133 Message: 8619

Hi Chris,
Your DDS testing prompts me to re-visit and update a few things. The voltages on the DDS schematic and the voltages used in the Test paragraphs are pretty old. The 3 ma current shown for the current to U3, was an original current verification when the DDS was "loaded" by the PLO module. At that time, the PLO "loading" was an unterminated line. U3 did not have the low pass filter in the output, either.
 It is now suggested in the documentation for the PLO to have a load of 50 ohms. This is the same load that is represented by the Log Detector and DC block. U3's low pass filter also increases U3 current. Therefore the real current for U3 should be about 12 ma, +/- 5 ma.
 Your measurements show that your DDS1 and DDS3 are performing well.
Scotty

--- On Sun, 10/16/11, neganur <neganur@...> wrote:

From: neganur <neganur@...>
Subject: [spectrumanalyzer] Re: DDS U3 current
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, October 16, 2011, 11:00 PM

I was testing my DDS1 and DDS3 last night and encountered something similar. My U3 is NC7SZ04M5XCT-ND from Digi-Key.

DDS 1 Test (log detector connected to J4 with DC block):

1. Voltage at P1-2 = 9.96 V (+10 V +/- 0.1 V)

2. Voltage at U1-1 = 9.30 V

3. U1-3, U2-6, U2-11, U2-18, and U2-23 = 4.93 V (+5.0 V +/- 0.1 V)

4. U3-5 = 4.78 V (should be 30 mV lower than U1-3)

5. U3-2 = 2.40 V (It should be +2.5 volts, +/- .1 volts)

6. U2-3 and U2-4 = 4.92 V

7 U2-1, U2-2, U2-26, U2-27 and U2-28 = 0 V

8. U2-12 = 1.268 (should be +1.248 volts, +/- .01 volts)

DDS 1 Test (J4 floating):

1. Voltage at P1-2 = 9.96 V (+10 V +/- 0.1 V)

2. Voltage at U1-1 = 9.39 V

3. U1-3, U2-6, U2-11, U2-18, and U2-23 = 4.93 V (+5.0 V +/- 0.1 V)

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7. U2-1, U2-2, U2-26, U2-27 and U2-28 = 0 V

8. 1.267 (should be +1.248 volts, +/- .01 volts)

With load: 15 mA

Without load: 5mA

I wonder if the voltages denoted in the DDS Module Test are for an unloaded Log Detector. Although the test specification asks to connect J4 to it via the DC block.

By the way,

" Run the MSA Program. The MSA Main Graph will open and sweep with the MSA in the Spectrum Analyzer mode."

Ver116, RevF doesn't do this. I have do select Mode->Spectrum Analyzer before it shows anything.

I repeated the test with DDS 3:

DDS 3 Test (log detector connected to J4 with DC block):

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2. Voltage at U1-1 = 9.28 V

3. U1-3, U2-6, U2-11, U2-18, and U2-23 = 4.93 V (+5.0 V +/- 0.1 V)

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DDS 1 Test (J4 floating):

1. Voltage at P1-2 = 9.96 V (+10 V +/- 0.1 V)

2. Voltage at U1-1 = 9.39 V

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6. U2-3 and U2-4 = 4.93 V

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8. 1.267 (should be +1.248 volts, +/- .01 volts)

With load: 15 mA

Without load: 5mA

Best regards

Chris

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:

>

> I don't know that the extra 10 mA causes any problem, but the static current draw should only be a few uA.

> Sam W.

>

> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:

> >

> > Here is what I did for this troubleshooting:

> > 1) Disconnect the load: Drops from 20mA to 13mA

> > 2) Remove R14 (33 ohm): Drops from 13mA to 11mA

> > 3) Remove R10 (100kohm): Drops from 11mA to 10.3mA

> > No short, the output stays at logic high 5V.

> >

> > Looks like the IC needs 10.3mA even it is in static state.

> >

> > Lin

> >

8620. PLO supply voltage

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-19 19:07:04 UTC
From: Jurgen
Topic: 8620 Message: 8620

In one of the schematics the 5V regulator is replaced with a jumper.
I am running mine with a 6V regulator and am getting ~+7dBm out.
This is a bit low.
The ROS1500 absolute ROS1500 max ratings are +5V.
The jumper would raise Vcc to ~9.5V.
Has this change been generally implemented?
There is no mention in the change notes.

Thanks, Jurgen

8621. Re: [spectrumanalyzer] PLO supply voltage

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-19 19:43:40 UTC
From: Geoff Moore
Topic: 8620 Message: 8621

Jurgen

I wonder if you are looking at the correct data sheet.

The ROS-1500+ (the + means it is a lead free device) has a DC operating power of 10 volts on Vcc with an absolute max supply of 11 volts on Vcc. The max tuning voltage is 22 volts on Vtune.

If by chance you are looking at ROS1500C device, then the Vcc is indeed 5 volts with a max tuning voltage of 7 volts.

It is only PLO2 that has the 5 volt regulator bypassed.

Keep building, it is all worth the effort.

Geoff

----- Original Message -----
From: Jurgen
To: spectrumanalyzer@yahoogroups.com
Sent: Wednesday, October 19, 2011 8:07 PM
Subject: [spectrumanalyzer] PLO supply voltage

In one of the schematics the 5V regulator is replaced with a jumper.
I am running mine with a 6V regulator and am getting ~+7dBm out.
This is a bit low.
The ROS1500 absolute ROS1500 max ratings are +5V.
The jumper would raise Vcc to ~9.5V.
Has this change been generally implemented?
There is no mention in the change notes.

Thanks, Jurgen

8622. Re: [spectrumanalyzer] PLO supply voltage

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-19 19:57:41 UTC
From: Jurgen
Topic: 8620 Message: 8622

OK, therein is the problem. I did not look properly.
I am actually using the ROS-2150VW which is rated at absolute max of 6V.
My mistake.
I guess there is nothing more I can do to increase the output level.

Thanks, Jurgen

On 10/19/2011 3:43 PM, Geoff Moore wrote:
>
> Jurgen
> I wonder if you are looking at the correct data sheet.
> The ROS-1500+ (the + means it is a lead free device) has a DC
> operating power of 10 volts on Vcc with an absolute max supply of 11
> volts on Vcc. The max tuning voltage is 22 volts on Vtune.
> If by chance you are looking at ROS1500C device, then the Vcc is
> indeed 5 volts with a max tuning voltage of 7 volts.
> It is only PLO2 that has the 5 volt regulator bypassed.
> Keep building, it is all worth the effort.
> Geoff
>
> ----- Original Message -----
> *From:* Jurgen <mailto:khj221@...>
> *To:* spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer@yahoogroups.com>
> *Sent:* Wednesday, October 19, 2011 8:07 PM
> *Subject:* [spectrumanalyzer] PLO supply voltage
>
> In one of the schematics the 5V regulator is replaced with a jumper.
> I am running mine with a 6V regulator and am getting ~+7dBm out.
> This is a bit low.
> The ROS1500 absolute ROS1500 max ratings are +5V.
> The jumper would raise Vcc to ~9.5V.
> Has this change been generally implemented?
> There is no mention in the change notes.
>
> Thanks, Jurgen
>
>

8623. Re: PLO supply voltage

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-19 21:41:36 UTC
From: Sam
Topic: 8620 Message: 8623

To clarify, PLO1 and PLO3 use the ROS-2150VW operating at 5 or 6 volts. PLO2, which doesn't need the broad tuning range of the other two, uses the ROS-1500 which operates on 10 V and thus does not use the regulator. The PCB is the same for all three; it's just a question of how you populate it.

I don't think you'll have any problem operating with 7 dBm.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> OK, therein is the problem. I did not look properly.
> I am actually using the ROS-2150VW which is rated at absolute max of 6V.
> My mistake.
> I guess there is nothing more I can do to increase the output level.
>
> Thanks, Jurgen
>
>
>
> On 10/19/2011 3:43 PM, Geoff Moore wrote:
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> > Jurgen
> > I wonder if you are looking at the correct data sheet.
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> > operating power of 10 volts on Vcc with an absolute max supply of 11
> > volts on Vcc. The max tuning voltage is 22 volts on Vtune.
> > If by chance you are looking at ROS1500C device, then the Vcc is
> > indeed 5 volts with a max tuning voltage of 7 volts.
> > It is only PLO2 that has the 5 volt regulator bypassed.
> > Keep building, it is all worth the effort.
> > Geoff
> >
> > ----- Original Message -----
> > *From:* Jurgen <mailto:khj221@...>
> > *To:* spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer@yahoogroups.com>
> > *Sent:* Wednesday, October 19, 2011 8:07 PM
> > *Subject:* [spectrumanalyzer] PLO supply voltage
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> > In one of the schematics the 5V regulator is replaced with a jumper.
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> > This is a bit low.
> > The ROS1500 absolute ROS1500 max ratings are +5V.
> > The jumper would raise Vcc to ~9.5V.
> > Has this change been generally implemented?

> > There is no mention in the change notes.
> >
> > Thanks, Jurgen
> >
> >
>

8624. Re: PLO 1 Debugging Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-23 17:38:36 UTC
From: neganur
Topic: 8476 Message: 8624

I had an awful lot of 76 mV peak to peak ripple on my +20V directly at the output pin of the control board (P23_2) which I was able to decrease to 10 mV pp by adding capacitors at C20, C21, C23, C24 and C25.

I then replaced the TC7662 with a TC7660 only to find that the ripple had increased to 44 mV pp, so I put the 7662 back. I then took an electrolytic low ESR capacitor, held it across all the capacitors in the voltage converter while watching the amplitude response in the MSA software, and found the best improvement at location C21.

Has this been an issue for anyone else?

I added some screen shots from the software and my oscilloscope in my album, since I could not find yours anymore.

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/910808747/pic/list

My Voltage converter is not shielded at all by the way. It's a huge mess on my desk at the moment :)

Best regards

Chris

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> I added a second 10 uf cap at C20, C21, C24, and C25 on the Control board
> and an additional 10 uf at C46 on PLO1 and PLO3.
>
> I found that shielding was necessary to clean up the output of PLO3
>
>
> The screen shots after the fix can be found at
>
> http://groups.yahoo.com/group/spectrumanalyzer/files/Eric%20W4EON
>
> Eric Nystrom
>

8625. Re: [spectrumanalyzer] Re: PLO 1 Debugging Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-23 17:54:25 UTC
From: Eric Nystrom
Topic: 8476 Message: 8625

Chris,

I added an additional 10 uf at C46 on PLO1 and PLO3 boards.

Did you try that also?

Eric Nystrom

From: neganur <neganur@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Sunday, October 23, 2011 1:38 PM
Subject: [spectrumanalyzer] Re: PLO 1 Debugging Update

I had an awful lot of 76 mV peak to peak ripple on my +20V directly at the output pin of the control board (P23_2) which I was able to decrease to 10 mV pp by adding capacitors at C20, C21, C23, C24 and C25.

I then replaced the TC7662 with a TC7660 only to find that the ripple had increased to 44 mV pp, so I put the 7662 back. I then took an electrolytic low ESR capacitor, held it across all the capacitors in the voltage converter while watching the amplitude response in the MSA software, and found the best improvement at location C21.

Has this been an issue for anyone else?

I added some screen shots from the software and my oscilloscope in my album, since I could not find yours anymore.

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My Voltage converter is not shielded at all by the way. It's a huge mess on my desk at the moment :)

Best regards

Chris

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>
> I added a second 10 uf cap at C20, C21, C24, and C25 on the Control board
> and an additional 10 uf at C46 on PLO1 and PLO3.
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> I found that shielding was necessary to clean up the output of PLO3
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> The screen shots after the fix can be found at
>
> http://groups.yahoo.com/group/spectrumanalyzer/files/Eric%20W4EON

>
> Eric Nystrom
>

8626. Re: PLO 1 Debugging Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-23 19:26:56 UTC
From: neganur
Topic: 8476 Message: 8626

Hi Eric,

yes, I did end up placing another 10uF on top of each C48 on the PLO 1 and 3 board. I'm down to 2 mVpp at the LT1677 but I am not quite satisfied. The problem is really at the output of the voltage converter. Would adding another 10 Ohm series resistor not be a better improvement than all those extra capacitors?

By the way, I got my hands on a couple of those NDK 10F15D filters. What values did you end up using for the matching components? 4.7uH and 33pF in parallel with a trimmer?

Chris

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> Chris,
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> I added an additional 10 uf at C46 on PLO1 and PLO3 boards.
>
> Did you try that also?
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> Â
> Eric Nystrom
>
>
> _____
> From: neganur <neganur@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Sunday, October 23, 2011 1:38 PM
> Subject: [spectrumanalyzer] Re: PLO 1 Debugging Update

8627. Re: [spectrumanalyzer] Re: PLO 1 Debugging Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-23 19:39:24 UTC
From: Eric Nystrom
Topic: 8476 Message: 8627

Chris,

Adding more resistance would drop the voltage further and might limit the tuning range. I don't
know if that would make a real difference or not. Are you using a linear or a switching supply
to power your MSA?

As to the filter. I am using the 4.7uf and 33pf with a trimmer, but it does not match the impedance
correctly for me. I need to work on that, but have not come up with any ideas yet. Do you have
access to other equipment that would allow you to determine the impedance of the filter?

Eric Nystrom

_____
From: neganur <neganur@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Sunday, October 23, 2011 3:26 PM
Subject: [spectrumanalyzer] Re: PLO 1 Debugging Update

Hi Eric,

yes, I did end up placing another 10uF on top of each C48 on the PLO 1 and 3 board. I'm down to 2 mVpp at the LT1677 but I am not quite satisfied. The problem is really at the output of the voltage converter. Would adding another 10 Ohm series resistor not be a better improvement than all those extra capacitors?

By the way, I got my hands on a couple of those NDK 10F15D filters. What values did you end up using for the matching components? 4.7uH and 33pF in parallel with a trimmer?

Chris

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
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> Chris,
>
> I added an additional 10 uf at C46 on PLO1 and PLO3 boards.
>
> Did you try that also?
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> Â
> Eric Nystrom
>
>
> _____

> From: neganur <neganur@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Sunday, October 23, 2011 1:38 PM
> Subject: [spectrumanalyzer] Re: PLO 1 Debugging Update

8628. Re: PLO 1 Debugging Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-23 21:04:35 UTC
From: neganur
Topic: 8476 Message: 8628

Hey

I'm using a HP6632B linear power supply (0.3 mV ripple). I'm not sure what I will use once everything is ready.

Regarding the filters, I may be able to measure something but I have no idea how to interpret it :) I'm still a filter newbie but Sam and Scotty may be able to point me in the right direction. I remember Sam had some nice document on filters, I will read some more.

I have access to a couple of network and emc analysers and I'm learning how to use them at the moment. I managed to print some impedance response curves but I'm not sure if that helps us. On top of that, I forgot to mark which plot belonged to which filter...but I will upload the pictures anyway.

http://groups.yahoo.com/group/spectrumanalyzer/files/Crystal%20Filters%20RBW/

I measured a NDK 10F15D, NDK 10P7D and NDK 10P17D. They are all from ebay and the sellers seem to have a lot of them available.

I haven't been able to find datasheets for them but lots of filters are similar with similar markings.

I believe that the 10F15D has a Zin/out of 3kOhm-3.3kOhm, 0 pF.

Chris

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> Chris,
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> Adding more resistance would drop the voltage further and might limit the tuning range.Â I don't
> know if that would make a real difference or not.Â Are you using a linear or a switching supply
> to power your MSA?
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>
> As to the filter.Â I am using the 4.7uf and 33pf with a trimmer, but it does not match the impedance
> correctly for me.Â I need to work on that, but have not come up with any ideas yet.Â Do you have
> access to other equipment that would allow you to determine the impedance of the filter?
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> From: neganur <neganur@...>
> To: spectrumanalyzer@yahoogroups.com
> Sent: Sunday, October 23, 2011 3:26 PM

> Subject: [spectrumanalyzer] Re: PLO 1 Debugging Update
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> Hi Eric,
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> yes, I did end up placing another 10uF on top of each C48 on the PLO 1 and 3 board. I'm down to 2 mVpp at the LT1677 but I am not quite satisfied. The problem is really at the output of the voltage converter. Would adding another 10 Ohm series resistor not be a better improvement than all those extra capacitors?
>
> By the way, I got my hands on a couple of those NDK 10F15D filters. What values did you end up using for the matching components? 4.7uH and 33pF in parallel with a trimmer?
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> Chris
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> --- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@> wrote:
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> > Chris,
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> > Eric Nystrom
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> > From: neganur <neganur@>
> > To: spectrumanalyzer@yahoogroups.com
> > Sent: Sunday, October 23, 2011 1:38 PM
> > Subject: [spectrumanalyzer] Re: PLO 1 Debugging Update
>

8629. Re: PLO 1 Debugging Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-24 14:08:35 UTC
From: Sam
Topic: 8476 Message: 8629

Be sure you are using X5R or X7R ceramic for the 10 uF caps; the cheaper types lose capacitance at high voltage. I believe others have gotten good results doubling up on the caps using the good-quality ones. One alternative is to build the 23V supply described on my web site. Its ripple is well below 1 mV.

Your impedance scans of the filters show that they are not being matched to 50 ohms. (I assume you scanned the input with a 50-ohm termination after the output impedance match--that termination might actually have been the VNA terminal used for transmission measurement.) Some pictures show a nice stable match, but at 100 ohms. Others show pretty erratic matching. The transmission has far too much ripple, which is due to the matching problem. I assume you are using an LC match, with the capacitor shunt to ground on each side of the filter (with trimmers parallel to those caps), and the inductor in series "outside" of the capacitor. Be sure you use an inductor with Q of at least 20 (25 or 30 is even better) measured near 10.7 MHz.

It is also possible that the filters don't actually have the impedance specified by the seller, or he may have mixed up which impedance goes with which bandwidth. You apparently have access to some sort of VNA. If you can create a Touchstone file of S21 and another of S11, you can load the data into the Two-Port Module of the MSA software (load S21 as S21 and S12 and load S11 as S11 and S22, to keep it simple), then open the Terminations window and use AutoMatch to calculate the impedance matching necessary for a simultaneous conjugate match. You can also do this auto matching with RFSim99, but you have to manually construct the two-port parameter file from the individual parameter files (unless your VNA does all four parameters at once.)

To be fancier, you could also measure S22 instead of just duplicating S11 as S22 (In theory S21=S12 so you can get by duplicating S21 to use for both values). In doing this with a ceramic filter specified as 330 ohms and 0 pF, I found that the reason the spec is 0 pF is not that the input and output have no reactance, but rather that it is not completely predictable and might be either capacitive or inductive, so the best they could do for a general spec is to say 0 pF.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "neganur" <neganur@...> wrote:
>
> Hey
>
> I'm using a HP6632B linear power supply (0.3 mV ripple). I'm not sure what I will use once everything is ready.
>
> Regarding the filters, I may be able to measure something but I have no idea how to interpret it :) I'm still a filter newbie but Sam and Scotty may be able to point me in the right direction. I remember Sam had some nice document on filters, I will read some more.
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> I have access to a couple of network and emc analysers and I'm learning how to use them at the moment. I managed to print some impedance response curves but I'm not sure if that helps us. On top of that, I forgot to mark which plot

belonged to which filter...but I will upload the pictures anyway.
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> http://groups.yahoo.com/group/spectrumanalyzer/files/Crystal%20Filters%20RBW/
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> I measured a NDK 10F15D, NDK 10P7D and NDK 10P17D. They are all from ebay and the sellers seem to have a lot of them available.
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> I haven't been able to find datasheets for them but lots of filters are similar with similar markings.
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> I believe that the 10F15D has a Zin/out of 3kOhm-3.3kOhm, 0 pF.
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> Chris
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> --- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@> wrote:
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> > Chris,
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> > Adding more resistance would drop the voltage further and might limit the tuning range.Â I don't
> > know if that would make a real difference or not.Â Are you using a linear or a switching supply
> > to power your MSA?
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> > As to the filter.Â I am using the 4.7uf and 33pf with a trimmer, but it does not match the impedance
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> > From: neganur <neganur@>
> > To: spectrumanalyzer@yahoogroups.com
> > Sent: Sunday, October 23, 2011 3:26 PM
> > Subject: [spectrumanalyzer] Re: PLO 1 Debugging Update
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> > Hi Eric,
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> > yes, I did end up placing another 10uF on top of each C48 on the PLO 1 and 3 board. I'm down to 2 mVpp at the LT1677 but I am not quite satisfied. The problem is really at the output of the voltage converter. Would adding another 10 Ohm series resistor not be a better improvement than all those extra capacitors?
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> > By the way, I got my hands on a couple of those NDK 10F15D filters. What values did you end up using for the matching components? 4.7uH and 33pF in parallel with a trimmer?
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> > --- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@> wrote:
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> > > Chris,
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> > > Eric Nystrom
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> > > _____
> > > From: neganur <neganur@>
> > > To: spectrumanalyzer@yahoogroups.com
> > > Sent: Sunday, October 23, 2011 1:38 PM
> > > Subject: [spectrumanalyzer] Re: PLO 1 Debugging Update
> >
>

8630. Re: PLO 1 Debugging Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-24 14:23:12 UTC
From: Sam
Topic: 8476 Message: 8630

Yahoo seems to be delaying or losing messages again, so I am re-posting it. Maybe it will show up twice.

Be sure you are using X5R or X7R ceramic for the 10 uF caps; the cheaper types lose capacitance at high voltage. I believe others have gotten good results doubling up on the caps using the good-quality ones. One alternative is to build the 23V supply described on my web site. Its ripple is well below 1 mV.

Your impedance scans of the filters show that they are not being matched to 50 ohms. (I assume you scanned the input with a 50-ohm termination after the output impedance match--that termination might actually have been the VNA terminal used for transmission measurement.) Some pictures show a nice stable match, but at 100 ohms. Others show pretty erratic matching. The transmission has far too much ripple, which is due to the matching problem. I assume you are using an LC match, with the capacitor shunt to ground on each side of the filter (with trimmers parallel to those caps), and the inductor in series "outside" of the capacitor. Be sure you use an inductor with Q of at least 20 (25 or 30 is even better) measured near 10.7 MHz.

It is also possible that the filters don't actually have the impedance specified by the seller, or he may have mixed up which impedance goes with which bandwidth. You apparently have access to some sort of VNA. If you can create a Touchstone file of S21 and another of S11, you can load the data into the Two-Port Module of the MSA software (load S21 as S21 and S12 and load S11 as S11 and S22, to keep it simple), then open the Terminations window and use AutoMatch to calculate the impedance matching necessary for a simultaneous conjugate match. You can also do this auto matching with RFSim99, but you have to manually construct the two-port parameter file from the individual parameter files (unless your VNA does all four parameters at once.)

To be fancier, you could also measure S22 instead of just duplicating S11 as S22 (In theory S21=S12 so you can get by duplicating S21 to use for both values). In doing this with a ceramic filter specified as 330 ohms and 0 pF, I found that the reason the spec is 0 pF is not that the input and output have no reactance, but rather that it is not completely predictable and might be either capacitive or inductive, so the best they could do for a general spec is to say 0 pF.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "neganur" <neganur@...> wrote:
>
> Hey
>
> I'm using a HP6632B linear power supply (0.3 mV ripple). I'm not sure what I will use once everything is ready.
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> Regarding the filters, I may be able to measure something but I have no idea how to interpret it :) I'm still a filter newbie but Sam and Scotty may be able to point me in the right direction. I remember Sam had some nice document on filters, I will read some more.

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> I have access to a couple of network and emc analysers and I'm learning how to use them at the moment. I managed to print some impedance response curves but I'm not sure if that helps us. On top of that, I forgot to mark which plot belonged to which filter...but I will upload the pictures anyway.
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> http://groups.yahoo.com/group/spectrumanalyzer/files/Crystal%20Filters%20RBW/
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> I measured a NDK 10F15D, NDK 10P7D and NDK 10P17D. They are all from ebay and the sellers seem to have a lot of them available.
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> I haven't been able to find datasheets for them but lots of filters are similar with similar markings.
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> I believe that the 10F15D has a Zin/out of 3kOhm-3.3kOhm, 0 pF.
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> Chris
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> --- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@> wrote:
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> > Chris,
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> > Adding more resistance would drop the voltage further and might limit the tuning range.Â I don't
> > know if that would make a real difference or not.Â Are you using a linear or a switching supply
> > to power your MSA?
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> >
> > As to the filter.Â I am using the 4.7uf and 33pf with a trimmer, but it does not match the impedance
> > correctly for me.Â I need to work on that, but have not come up with any ideas yet.Â Do you have
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> > Eric Nystrom
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> > _____
> > From: neganur <neganur@>
> > To: spectrumanalyzer@yahoogroups.com
> > Sent: Sunday, October 23, 2011 3:26 PM
> > Subject: [spectrumanalyzer] Re: PLO 1 Debugging Update
> >
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> > Â
> > Hi Eric,
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> > yes, I did end up placing another 10uF on top of each C48 on the PLO 1 and 3 board. I'm down to 2 mVpp at the LT1677 but I am not quite satisfied. The problem is really at the output of the voltage converter. Would adding another 10 Ohm series resistor not be a better improvement than all those extra capacitors?
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> > By the way, I got my hands on a couple of those NDK 10F15D filters. What values did you end up using for the

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> > Chris
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> > --- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@> wrote:
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> > > Chris,
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> > > Eric Nystrom
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> > > From: neganur <neganur@>
> > > To: spectrumanalyzer@yahoogroups.com
> > > Sent: Sunday, October 23, 2011 1:38 PM
> > > Subject: [spectrumanalyzer] Re: PLO 1 Debugging Update
> >
>

8631. Re: PLO 1 Debugging Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-27 07:33:09 UTC
From: neganur
Topic: 8476 Message: 8631

Sam, Eric

just a short update, unfortunately my time is being sucked up by project work.

Thanks for you reply Sam! The document I remembered was "Impedance Matching of Filters with the MSA" and it is very useful.

I have recorded all four S parameters in touchstone format for all the filters I have during this week. It turned out to be difficult to get the data out of the machines since the only floppy drive that actually worked was of the analyser that apparently did not support the touchstone format. Long story short, I imported a lot of *.s1p files into the MSA software and used it to save the data as s2p files. I have uploaded most of the data to the files section.

http://groups.yahoo.com/group/spectrumanalyzer/files/Crystal%20Filters%20RBW/

I tried using RFsim99 but the application seems to complain about the files "invalid floating point operation". I The MSA software crashes often when I use the two-port matching on my Win7 machine. It runs just fine on my WinXP laptop though. I can provide error logs if you want.

Eric, I hope this helps you to find out what the matching circuit should be like.

I will write more later.

Chris

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Yahoo seems to be delaying or losing messages again, so I am re-posting it. Maybe it will show up twice.
>
> Be sure you are using X5R or X7R ceramic for the 10 uF caps; the cheaper types lose capacitance at high voltage. I believe others have gotten good results doubling up on the caps using the good-quality ones. One alternative is to build the 23V supply described on my web site. Its ripple is well below 1 mV.
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> It is also possible that the filters don't actually have the impedance specified by the seller, or he may have mixed up which impedance goes with which bandwidth. You apparently have access to some sort of VNA. If you can create a Touchstone file of S21 and another of S11, you can load the data into the Two-Port Module of the MSA software (load S21 as S21 and S12 and load S11 as S11 and S22, to keep it simple), then open the Terminations window and use AutoMatch to calculate the impedance matching necessary for a simultaneous conjugate match. You can also do this auto matching with RFSim99, but you have to manually construct the two-port parameter file from the individual parameter files (unless your VNA does all four parameters at once.)
>
> To be fancier, you could also measure S22 instead of just duplicating S11 as S22 (In theory S21=S12 so you can get by duplicating S21 to use for both values). In doing this with a ceramic filter specified as 330 ohms and 0 pF, I found that the reason the spec is 0 pF is not that the input and output have no reactance, but rather that it is not completely predictable and might be either capacitive or inductive, so the best they could do for a general spec is to say 0 pF.
>
> Sam W.
>

8632. Re: PLO 1 Debugging Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-27 17:44:33 UTC
From: Sam
Topic: 8476 Message: 8632

I looked at one of the s2p files. The frequency steps in 1 kHz increments but repeats many times before incrementing--and the data at the repeated frequency is not constant. I suspect what is happening is that the VNA is taking smaller steps but rounding off the frequency to the nearest kHz when it sends it to the file. This may be causing the errors, since Touchstone files are supposed to have the frequency increasing at every step.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "neganur" <neganur@...> wrote:
>
> Sam, Eric
>
> just a short update, unfortunately my time is being sucked up by project work.
>
> Thanks for you reply Sam! The document I remembered was "Impedance Matching of Filters with the MSA" and it is very useful.
>
> I have recorded all four S parameters in touchstone format for all the filters I have during this week. It turned out to be difficult to get the data out of the machines since the only floppy drive that actually worked was of the analyser that apparently did not support the touchstone format. Long story short, I imported a lot of *.s1p files into the MSA software and used it to save the data as s2p files. I have uploaded most of the data to the files section.
>
> http://groups.yahoo.com/group/spectrumanalyzer/files/Crystal%20Filters%20RBW/
>
>
> I tried using RFsim99 but the application seems to complain about the files "invalid floating point operation". I The MSA software crashes often when I use the two-port matching on my Win7 machine. It runs just fine on my WinXP laptop though. I can provide error logs if you want.
>
>
> Eric, I hope this helps you to find out what the matching circuit should be like.
>
> I will write more later.
>
> Chris
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Yahoo seems to be delaying or losing messages again, so I am re-posting it. Maybe it will show up twice.
> >
> > Be sure you are using X5R or X7R ceramic for the 10 uF caps; the cheaper types lose capacitance at high voltage. I believe others have gotten good results doubling up on the

caps using the good-quality ones. One alternative is to build the 23V supply described on my web site. Its ripple is well below 1 mV.
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> >
> > Sam W.
> >
>

8633. Re: PLO 1 Debugging Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-28 01:11:45 UTC
From: neganur
Topic: 8476 Message: 8633

Eric,

I was able to get a working match for the 11F15DG. I used 5.6uH and 33pF + a 5...30pF trimmer. Try RFsim99 with a Zin/out of 2.4kOhm/0pF.

Chris

Have a look at the MSA screenshot of the filter in the files section:

http://groups.yahoo.com/group/spectrumanalyzer/files/Crystal%20Filters%20RBW/NDK%2010F15D/

--- In spectrumanalyzer@yahoogroups.com, Eric Nystrom <gloimon@...> wrote:
>
> Chris,
>
> Adding more resistance would drop the voltage further and might limit the tuning range.Â I don't
> know if that would make a real difference or not.Â Are you using a linear or a switching supply
> to power your MSA?
>
>
> As to the filter.Â I am using the 4.7uf and 33pf with a trimmer, but it does not match the impedance
> correctly for me.Â I need to work on that, but have not come up with any ideas yet.Â Do you have
> access to other equipment that would allow you to determine the impedance of the filter?
>
> Â
> Eric Nystrom

8634. Re: PLO 1 Debugging Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-28 02:54:00 UTC
From: neganur
Topic: 8476 Message: 8634

Oh that explains a lot. I noticed that the user interface was rounding to kHz while markers were displayed with 100 Hz resolution. I'll have a look in the manual since I can print single sheets of S21 data with 10 Hz resolution.

Thanks for the hint!

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I looked at one of the s2p files. The frequency steps in 1 kHz increments but repeats many times before incrementing--and the data at the repeated frequency is not constant. I suspect what is happening is that the VNA is taking smaller steps but rounding off the frequency to the nearest kHz when it sends it to the file. This may be causing the errors, since Touchstone files are supposed to have the frequency increasing at every step.
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> --- In spectrumanalyzer@yahoogroups.com, "neganur" <neganur@> wrote:
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> > Sam, Eric
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> > just a short update, unfortunately my time is being sucked up by project work.
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> > I have recorded all four S parameters in touchstone format for all the filters I have during this week. It turned out to be difficult to get the data out of the machines since the only floppy drive that actually worked was of the analyser that apparently did not support the touchstone format. Long story short, I imported a lot of *.s1p files into the MSA software and used it to save the data as s2p files. I have uploaded most of the data to the files section.
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> > http://groups.yahoo.com/group/spectrumanalyzer/files/Crystal%20Filters%20RBW/
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> > I tried using RFsim99 but the application seems to complain about the files "invalid floating point operation". I The MSA software crashes often when I use the two-port matching on my Win7 machine. It runs just fine on my WinXP laptop though. I can provide error logs if you want.
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> >
> > Eric, I hope this helps you to find out what the matching circuit should be like.
> >
> > I will write more later.
> >
> > Chris

> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > Yahoo seems to be delaying or losing messages again, so I am re-posting it. Maybe it will show up twice.
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> > >
> > > Sam W.
> > >
> >
>

8635. Re: PLO 1 Debugging Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-29 11:11:15 UTC
From: neganur
Topic: 8476 Message: 8635

Sam,

I am going to start a new post about filters soon since it's unrelated to the PLO debugging.

Regarding the nice match at 100 ohms, could it be that the filter has an integrated matching transformer? I finally found a datasheet that looks like it contains the two filters with the 100 ohms impedance response.

The package is really big (D-100), approximately 1 x 1.5 x 0.5 inches

Chris

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:

> Some pictures show a nice stable match, but at 100 ohms.

8636. Filter Matching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-29 13:38:15 UTC
From: Sam
Topic: 7251 Message: 8636

Assuming your scan did not include any matching components, it does seem likely that the filter has some internal matching to a relatively low impedance. Your scan shows 100 ohms input impedance, but the scan would be done with 50 ohms on the output. A filter with impedance of 100 ohms should show 100 ohms input impedance with 100 ohms on the output, which suggests that yours has an actual impedance of something higher than 100 ohms.

Here is a possible solution. Take three entries from your s2p file near the filter center. Tweak the frequencies if necessary to make them ascending. Then make a new s2p file with just those entries. Use Auto Match in either the MSA software or RFSim99. That won't give you much of a graph, but it will give you the necessary matching components.

Sam W.

Sam,

I am going to start a new post about filters soon since it's unrelated to the
PLO debugging.

Regarding the nice match at 100 ohms, could it be that the filter has an integrated matching transformer? I finally found a datasheet that looks like it
contains the two filters with the 100 ohms impedance response.

The package is really big (D-100), approximately 1 x 1.5 x 0.5 inches

Chris

8637. Re: Filter Matching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-29 14:21:35 UTC
From: Greg Broburg
Topic: 7251 Message: 8637

Hello Sam;

Just wondering if there might be a germ of an idea here where digitally programmable source and load resistances could be made created for looking at filters. Sort of like an attenuator but series resistance to be added on command to the 50 ohm source and same for the effective load resistance. Perhaps it would be better to start with a higher impedance and do these as shunts? Perhaps a transformer to 2k ohms up and down? Most of the filters are under 100 MHz, even a 50 MHz limit would be ok. Obviously the gain through the system changes with these ideas so some concept of calibration needs to go with the switches. Crazy? Anybody seen anything like this from a past life?

Regards;

Greg

On 10/29/2011 8:38 AM, Sam wrote:
>
> Assuming your scan did not include any matching components, it does
> seem likely that the filter has some internal matching to a relatively
> low impedance. Your scan shows 100 ohms input impedance, but the scan
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> them ascending. Then make a new s2p file with just those entries. Use
> Auto Match in either the MSA software or RFSim99. That won't give you
> much of a graph, but it will give you the necessary matching components.
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> /
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>
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> PLO debugging.
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> Regarding the nice match at 100 ohms, could it be that the filter has
> an/ /
> integrated matching transformer? I finally found a datasheet that
> looks like it
> contains the two filters with the 100 ohms impedance response.

>
> The package is really big (D-100), approximately 1 x 1.5 x 0.5 inches/ /
>
> Chris/
>
>

8638. Crystal Filter Matching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-29 17:23:18 UTC
From: william
Topic: 1255 Message: 8638

Hi All,
Since there have been some recent postings about crystal filter matching, this might be of some interest.
We often find really good deals on crystal filters on E-bay but there are a few things to consider.
1. Are these filters "over-runs"? Meaning, did the mfg make more than his customer needed and sold them to the E-bay vendor. If so, this is good. The best situation possible.
2. Are these filters "rejects"? Meaning, they failed one or more of the mfg's specifications. If a cosmetic defect, this is good. If the filter is out-of-spec electrically, this can be ok or bad, depending on the spec. that it failed.

And the one that is the most misunderstood:
3. Are these filters "deviants"? Meaning, the mfg modified one of their "standard" designs for a customer and these became "over-runs". This can be good, but the specifications may be entirely different than those for a "standard" filter. As an example, a mfg's "standard" filter had an unbalanced input and output (the most common configuration). But the "deviant" has a balanced input and output. The mfg would normally re-mark the "deviant" filter with a variant part number, but may still be very similar to the part number of the "standard". I cringe when someone says "use the spec for PN-XYZ for PN-XYz. They are similar so they must be the same." If a filter's part number cannot be 100% associated with its mfg's "standard" part number, it is a "deviant". And worse, the mfg will not give you its specs, due to contractual agreements between the mfg. and his original customer.

Over the years, I have seen "deviants" everywhere, not just in filters. They can be transistors, IC's, or anything. "Deviants" are not bad, they just need to be understood.
Scotty

8639. Re: Filter Matching

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-29 22:40:20 UTC
From: Sam
Topic: 7251 Message: 8639

Greg,
That might be feasible. The complication would be that the response can be very sensitive to reactance, so you would need to be able to iterate through reactances as well.

This sort of iteration is what I originally expected to do in software for AutoMatch. Fortunately, however, it turns out there is a reasonably straightforward formula for finding the required in/out impedances for a simultaneous conjugate match, which I found in a text by Pozar. So the simplest method seems to be to determine the four S-parameters and apply the formula.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Greg Broburg <semiflex@...> wrote:
>
> Hello Sam;
>
> Just wondering if there might be a germ of an idea here where digitally
> programmable source and load resistances could be made created for
> looking at filters. Sort of like an attenuator but series resistance to
> be added on command to the 50 ohm source and same for the effective load
> resistance. Perhaps it would be better to start with a higher impedance
> and do these as shunts? Perhaps a transformer to 2k ohms up and down?
> Most of the filters are under 100 MHz, even a 50 MHz limit would be ok.
> Obviously the gain through the system changes with these ideas so some
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> Regards;
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> >
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>

8640. Sam: PCB Filters as cavity filter replacement

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-29 23:50:33 UTC
From: Dan Andersson
Topic: 8640 Message: 8640

Sam,

I promised to come back after I tested the PCB filters as an option to cavity filters for 1013MHz.

I have been tied up with to much other stuff so I haven't been able to spend the time I needed fully out but...

The results are - forget it... At least for "normal deadly homebrewers with a budget".

I managed to make workable filters but only with a lot of hands on - on every filter I made.

I can make the filters with an accuracy (repeatability) of better than 0.0002" so accuracy
is not the problem, the laminate materials are, in combination with the enclosure.

I can make filters on PTFE laminates from Taconics, Rogers and so on. To make these work, I had to make
an alu enclosure with mounting ridges/fixtures so the PCB was forced into a specific position to end up
on the designed+hand tuned frequency as well as glued inplace with silver epoxy. These filters doesn't like the narrow bandwidth required and this showed to be the Achilles heal. Any deviation in the mounting inside the enclosure and the filter is off.

I can make "decent" filters on FR4 but with no way near the required bandwidth.

I did some cost/time breakdown and put simply, it's easier and cheaper to make cavity filters.
The size of a PCB filter is by all means smaller but it's not worth it.

Luckily, I have access to one of these horribly silly expensive softwares that can do microstrip filters at will. Still, the theoretical bandwidth is there but never in real life when put on test with my VNA.

It's a pity but it's just not a suitable solution.

I can of course send dimensions to anyone interested if they want to test by themselves. (unless everyone want it :)

With these tests in my rear mirror, I'm considering myself lucky not to have to work with filter design/production on a daily basis - I'd go bonkers!

I made 25-ish filters to verify the possibility to produce a batch of 1013MHz filters for the spectrum analyzer build but almost each of these filters behave slightly different...

I made 5+ filters for another ecm project and another frequency, but with a rather exotic (read as - expeeensive) PTFE/ceramic material. These worked out good but the bandwidth

wasn't as narrow.
(No, I can't show photo's of these - sorry)

But as I see in the group now, it looks like most of the specc builders are content with the cavity filter build.

I'm archiving this for now...

//Dan

8641. Re: Sam: PCB Filters as cavity filter replacement

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-30 15:12:21 UTC
From: Sam
Topic: 8640 Message: 8641

Dan,
Thanks for the effort. It would have been great had it worked out. But the PCB filter idea may still be useful.

Let me point out something about bandwidth: You can make a very operational MSA with a pretty crummy bandwidth for the IF1 filter. The downside is the creation of images in SA mode. However, to get your MSA up and running well enough to test out the various modules, a PCB filter might do just fine. For example, if you want to view an oscillator signal, you could just ignore the image. For VNA purposes, such as scanning an RBW filter, I don't think the IF1 filter bandwidth has much relevance, if any.

I get the impression that the cavity filter is a roadblock for many people in getting started. Maybe it would be better to start with a simple filter and worry about the ultimate cavity filter when everything else is done. I operated for over a year with a low grade cavity filter until I got the final one done.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:
>
>
>
> Sam,
>
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> I have been tied up with to much other stuff so I haven't been able to spend the time I needed fully out but...
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> I can of course send dimensions to anyone interested if they want to test by themselves.
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> With these tests in my rear mirror, I'm considering myself lucky not to have to work with filter design/production on a daily basis - I'd go bonkers!
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> I'm archiving this for now...
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> //Dan
>

8642. Re: [spectrumanalyzer] Re: Sam: PCB Filters as cavity filter replacement

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-30 15:44:06 UTC
From: w4zcb
Topic: 8640 Message: 8642

Ah, but Sam! You really only have two options. Build the cavity first so everything later seems like childs play, or build everything else first so you have so much invested you HAVE to do a cavity filter. In truth, and I have made a half dozen, and even scaled one to clean up a quadrupled 245 MHz OCXO for a clock for a AD9910 DDS. They aren't such a tough nut to crack. Particularly after the first one.

W4ZCB

I get the impression that the cavity filter is a roadblock for many people in getting started. Maybe it would be better to start with a simple filter and worry about the ultimate cavity filter when everything else is done. I operated for over a year with a low grade cavity filter until I got the final one done.

Sam W.

8643. Re: [spectrumanalyzer] Re: Sam: PCB Filters as cavity filter replacement

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-30 16:14:20 UTC
From: Dan Andersson
Topic: 8640 Message: 8643

Well Sam,

I saw a UK company looking for a cavity filter engineer up in Necastle upon Thyne - and they paid double engineering wages for that position...

But as usual, if you made one or two, it becomes easier every time..

The softwares that can do this are way to complex to use. Propably written by boffins for other boffins...

I'd love to see a software where I can tell external sizes and restrictions, Centre freq, BW, filter linearity and attenuation >> The press a button and out pops a proper set of drawings...

But no. It works more or less this way with PCB filters but not for cavity filters.

I have some ecm stuff for 1275MHz and 1575MHz on order so I might give it another go as 1275 is not to far off and the process of building them should be able to re-size for 1013. We'll see.

//Dan

On Sun, 30 Oct 2011 15:12:21 -0000
"Sam" <swetterlin@...> wrote:

> Dan,
> Thanks for the effort. It would have been great had it worked out. But the PCB filter idea may still be useful.
>
> Let me point out something about bandwidth: You can make a very operational MSA with a pretty crummy bandwidth for the IF1 filter. The downside is the creation of images in SA mode. However, to get your MSA up and running well enough to test out the various modules, a PCB filter might do just fine. For example, if you want to view an oscillator signal, you could just ignore the image. For VNA purposes, such as scanning an RBW filter, I don't think the IF1 filter bandwidth has much relevance, if any.
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> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:
> >
> >
> >

> > Sam,
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> > //Dan
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8644. RE: [spectrumanalyzer] Sam: PCB Filters as cavity filter replacement

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-30 17:40:57 UTC
From: NeilDouglas
Topic: 8640 Message: 8644

Dan,

Have you tried the CQ filter type on page 37 of the document below?

http://maxwell.uwaterloo.ca/~myu/publications/WMB-9-color-Hong.pdf

It seems to have the desired narrow passband.

From the photos he has his example in a fancy box, and I suppose the
laminate is exotic.

Do programs like Sonnet model the effects of the enclosure accurately?

NeilD

From: spectrumanalyzer@yahoogroups.com
[mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of Dan Andersson
Sent: 30 October 2011 00:51
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Sam: PCB Filters as cavity filter replacement

Sam,

I promised to come back after I tested the PCB filters as an option to
cavity filters for 1013MHz.

I have been tied up with to much other stuff so I haven't been able to spend
the time I needed fully out but...

The results are - forget it... At least for "normal deadly homebrewers with
a budget".

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With these tests in my rear mirror, I'm considering myself lucky not to have to work with filter design/production on a daily basis - I'd go bonkers!

I made 25-ish filters to verify the possibility to produce a batch of 1013MHz filters for the spectrum analyzer build but almost each of these filters behave slightly different...

I made 5+ filters for another ecm project and another frequency, but with a rather exotic (read as - expeeensive) PTFE/ceramic material. These worked out good but the bandwidth wasn't as narrow.
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But as I see in the group now, it looks like most of the specc builders are content with the cavity filter build.

I'm archiving this for now...

//Dan

8645. Re: Sam: PCB Filters as cavity filter replacement

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-30 18:05:59 UTC
From: Sam
Topic: 8640 Message: 8645

That's exactly right. After building the modules you'll be motivated to do the cavity filter. I think the important thing is to get started and feel like you are making progress, and many builders can probably finish half the modules in the time it would take them to get pumped for doing the cavity filter.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "w4zcb" <w4zcb@...> wrote:
>
> Ah, but Sam! You really only have two options. Build the cavity first
> so everything later seems like childs play, or build everything else
> first so you have so much invested you HAVE to do a cavity filter. In
> truth, and I have made a half dozen, and even scaled one to clean up a
> quadrupled 245 MHz OCXO for a clock for a AD9910 DDS. They aren't such
> a tough nut to crack. Particularly after the first one.
>
> W4ZCB
>
> I get the impression that the cavity filter is a roadblock for many
> people in getting started. Maybe it would be better to start with a
> simple filter and worry about the ultimate cavity filter when
> everything else is done. I operated for over a year with a low grade
> cavity filter until I got the final one done.
>
> Sam W.
>

8646. Re: [spectrumanalyzer] Sam: PCB Filters as cavity filter replacement

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-30 18:27:51 UTC
From: Dan Andersson
Topic: 8640 Message: 8646

Neil,

I don't theink the laminat is that exotic,only expensive :)

Yes, the CQ filter looks as it's possible to use. But! I wonder how many iterations he had running before the final target was reached?! It's OK to burn FR4 but I need to save my supply of Rogers... :)

FR4 works "fine" (umm! good enuf) up to 5-5 GHz unless you do demanding stuff like super stable vco's etc and - hrmmm, filters. But as Sam writes, keep the bandwidth a but wider and it's easier.

The CQ filter in the example neet to be a bit sharper to make SA people really happy.

I'll see if I can find the math for it.

//Dan

On Sun, 30 Oct 2011 17:40:57 -0000
"NeilDouglas" <neil.douglas@...> wrote:

> Dan,
>
>
>
> Have you tried the CQ filter type on page 37 of the document below?
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> http://maxwell.uwaterloo.ca/~myu/publications/WMB-9-color-Hong.pdf
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> Sent: 30 October 2011 00:51
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8647. Re: [spectrumanalyzer] Sam: PCB Filters as cavity filter replacement

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-30 18:31:11 UTC
From: Dan Andersson
Topic: 8640 Message: 8647

Neil,

Enclosure effects? Yes and no. The softwares manage solid boxes with a decent prediction. But if you use the flyfy microwave "antibounce" stuff under the lid as I usually do, it requires testing. The sides proximity is more important than the height to the lid if you allow for 10+mm or so between the board and the lid. Make it 20mm with microwave foam and it'll still be predictable.

//Dan

On Sun, 30 Oct 2011 17:40:57 -0000
"NeilDouglas" <neil.douglas@...> wrote:

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8648. Re: [spectrumanalyzer] Sam: PCB Filters as cavity filter replacement

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-30 18:39:56 UTC
From: Dan Andersson
Topic: 8640 Message: 8648

I have this book by Hong in my library...

But... The boffin level is a bit to high :)

//Dan

On Sun, 30 Oct 2011 17:40:57 -0000
"NeilDouglas" <neil.douglas@...> wrote:

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8649. Re: Sam: PCB Filters as cavity filter replacement

Yahoo group: spectrumanalyzer (2011)
Date: 2011-10-31 01:28:32 UTC
From: Len
Topic: 8640 Message: 8649

Hello Group

Look in the Len Spyker group files area and look for my spreadsheets on coaxial filters.

The coax filter design formulas in the spreadsheet are from a serious RF book.

You will see the coax filter design has a Q well over 4000 (four thousand) no this is not a misprint.

So I am not surprised that other techniques and constructions have trouble matching that Q and low loss.

Regards Len (builder of 30 coax filters).

8650. HF3 relay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-02 14:41:17 UTC
From: Sam
Topic: 8650 Message: 8650

I have used the HF3 relays in a couple of past designs, but they seemed to become unavailable in 50-ohm versions. I discovered that Allied Electronics has them at a reasonable cost ($5.60 qty 1). They are non-stocked "Extended Range" items, but available with 8-10 day delays. In particular, they have the HF3-56 (12V non-latching) and HF3-96 (12V two-coil latching). These will operate down to 9V on only about 10 mA, and have excellent isolation.

If anyone bought the Signal Router board but never got the relays, you may want to check these out.

Sam W.

8651. Re: HF3 relay

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-02 15:20:55 UTC
From: Sam
Topic: 8650 Message: 8651

The Signal Router actually used the HF3-93 (5V) which Allied does not have, but they do have the HF3-92 (4.5 V) which would work just as well.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have used the HF3 relays in a couple of past designs, but they seemed to become unavailable in 50-ohm versions. I discovered that Allied Electronics has them at a reasonable cost ($5.60 qty 1). They are non-stocked "Extended Range" items, but available with 8-10 day delays. In particular, they have the HF3-56 (12V non-latching) and HF3-96 (12V two-coil latching). These will operate down to 9V on only about 10 mA, and have excellent isolation.
>
> If anyone bought the Signal Router board but never got the relays, you may want to check these out.
>
> Sam W.
>

8652. Group Buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-03 00:07:11 UTC
From: Sam
Topic: 8652 Message: 8652

I have received the parts for the group buy of the input switch, etc. They will go out shortly, except a couple people will be delayed a few days because I under-counted the number of PE4251. (Apparently, I can only count to 500.) I also ended up with a couple of extra PCBs, so if anyone wants one (no other parts included), let me know. Cost is $18.

If you ordered but did not pay, please do so. I have received lots of payments, but have not tallied who paid and who didn't. I have been distracted because my mother, who lives with me, fell and broke her arm. My son will be handling the shipments.

Sam W.

8653. Re: Group Buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-04 01:06:36 UTC
From: Gary VK2KYP
Topic: 8652 Message: 8653

Hi Sam, thank you for organising the Group Buy.

I am in Australia, as I understand you will be shipping a bulk order to Bill Maxwell (thanks Bill).

The cost for each Australian kit will be $46 is this correct?

Are you ready for to receive payment from us down under" and what Pay{al address can I send the money to?

Thank you

regards Gary VK2KYP

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
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>
> Sam W.
>

8655. Re: Group Buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-04 21:34:28 UTC
From: Sam
Topic: 8652 Message: 8655

Jim,
I will put your name on the list of people to contact once I know that everyone got what they ordered, so I know the remaining boards are indeed extra.

(Also deleted your message so your address does not appear on Yahoo.)
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Jim McLucas" <jwmc@...> wrote:
>
> Hi Sam,
>
> I would like to have one of the extra PCBs. How do I pay for it?
>
> Regards,
>
> Jim McLucas
>

8656. Using the MSA a Little Differently

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-05 02:24:31 UTC
From: nealmartini
Topic: 8656 Message: 8656

I have been experimenting with something on my MSA that you all might be interested in trying. Very briefly, I have been using the output of the RFamp (before the final filter) to look at signals in the time domain. Additionally, I am using this same signal as a front end to a software defined radio to get very high resolution spectra and to listen to all kinds of radio signals.

Here are a few examples to demonstrate what I mean:

1. I attached a short wire antenna to the input of the MSA and activated an old remote control for a garage door opener. The remote uses OOSK modulation and the carrier is around 390 MHz. I connected the MSAs RFamp output to a low frequency scope and tuned the MSA to the 390 MHz center frequency. These two pictures show the hookup and scope output.

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/995283679/pic/316786198/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/995283679/pic/316786198/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

Here is another example of a 300 MHz AM modulated signal connected to the MSA input and the time domain viewing of the RFamp output on a scope.

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/995283679/pic/316786198/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

Incidentally, I have the RFamp output hooked up to a coaxial relay so I can switch the RFamp to either the MSA final filter or to an external connector that I hook to a scope.

2. Next I used the MSA RFamp output as a front end to a free downloadable FLEX RADIO software defined radio that runs in a PC. To use this software, you have to convert the RFamp signal to a baseband IQ signal so that it can be input to the PC via the sound card AtoD converter. I assembled an Ensemble II IQ converter (available online for $40)to generate the IQ signals. Basically, the Ensemble II takes the RFamps aprrox 10 MHz bandlimited signal and shifts it near DC. Once the IQ signal is sampled by the PC's sound card, you can use the FLEX RADIO software to get very high resolution spectra. You can also tune your MSA to radio signals and the FLEX RADIO will demodulate things so you can hear the radio broadcasts on your PC.

A few pictures to once again show what I am talking about. First here's an AM signal with 100Hz sine modulation shown in the FLEX RADIO.

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/995283679/pic/316786198/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

That 100 Hz line spacing would be very hard to produce in the MSA alone unless you had a very good final filter. Next here is an FM modulated signal, once again with a 100 Hz sine modulating signal.

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/995283679/pic/316786198/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

Finally, here is a 1350 KHz AM station being listened to on the FLEX RADIO with the MSA as the front end IF signal generator.

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/995283679/pic/316786198/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

Sorry this is so long, but there is alot here. There are more pictures in my photo album at the group site.

I hope you find this interesting.

Neal

8657. Using the MSA a Little Differently----Corrected Links

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-05 02:44:56 UTC
From: nealmartini
Topic: 8657 Message: 8657

I screwed up the links in my last posting-Sorry. Please use this posting to view photos.

I have been experimenting with something on my MSA that you all might be interested in trying. Very briefly, I have been using the output of the RFamp (before the final filter) to look at signals in the time domain. Additionally, I am using this same signal as a front end to a software defined radio to get very high resolution spectra and to listen to all kinds of radio signals.

Here are a few examples to demonstrate what I mean:

1. I attached a short wire antenna to the input of the MSA and activated an old remote control for a garage door opener. The remote uses OOSK modulation and the carrier is around 390 MHz. I connected the MSAs RFamp output to a low frequency scope and tuned the MSA to the 390 MHz center frequency. These two pictures show the hookup and scope output.

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/995283679/pic/316786198/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

See "Remote_Signal_Time_Domain" in photo album

Here is another example of a 300 MHz AM modulated signal connected to the MSA input and the time domain viewing of the RFamp output on a scope.

See "AM_Signal_on_Scope" in photo album

Incidentally, I have the RFamp output hooked up to a coaxial relay so I can switch the RFamp to either the MSA final filter or to an external connector that I hook to a scope.

2. Next I used the MSA RFamp output as a front end to a free downloadable FLEX RADIO software defined radio that runs in a PC. To use this software, you have to convert the RFamp signal to a baseband IQ signal so that it can be input to the PC via the sound card AtoD converter. I assembled an Ensemble II IQ converter (available online for $40)to generate the IQ signals. Basically, the Ensemble II takes the RFamps aprrox 10 MHz bandlimited signal and shifts it near DC. Once the IQ signal is sampled by the PC's sound card, you can use the FLEX RADIO software to get very high resolution spectra. You can also tune your MSA to radio signals and the FLEX RADIO will demodulate things so you can hear the radio broadcasts on your PC.

A few pictures to once again show what I am talking about. First here's an AM signal with 100Hz sine modulation shown in the FLEX RADIO.

See "AM_100Hz" in photo album

That 100 Hz line spacing would be very hard to produce in the MSA alone unless you had a very good final filter. Next here is an FM modulated signal, once again with a 100 Hz sine modulating signal.

See "ReFM_100Hz_1kHzDev" in photo album

Finally, here is a 1350 KHz AM station being listened to on the FLEX RADIO with the MSA as the front end IF signal generator.

See "ESPN_AM1350KHz_SDR" in photo album

Sorry this is so long, but there is alot here. There are more pictures in my photo album at the group site.

I hope you find this interesting.

Neal

8658. Re: Using the MSA a Little Differently

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-05 14:35:31 UTC
From: Sam
Topic: 8656 Message: 8658

Neal,
That is very slick. As far as switching goes, unless the Ensemble has significant junk signals headed back to the MSA, you don't need high isolation switching; you just don't want the RF amp loaded by both destinations at once. So you could use just about any switching IC or relay, or even PIN diodes. You could even use a resistor tap which would allow both to operate at once, though reducing the signal level slightly.

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Sam W.

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> Neal
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8659. Re: Using the MSA a Little Differently

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-05 14:41:13 UTC
From: Sam
Topic: 8656 Message: 8659

Oops, I see you fixed the links.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Neal,
> That is very slick. As far as switching goes, unless the Ensemble has significant junk signals headed back to the MSA, you don't need high isolation switching; you just don't want the RF amp loaded by both destinations at once. So you could use just about any switching IC or relay, or even PIN diodes. You could even use a resistor tap which would allow both to operate at once, though reducing the signal level slightly.
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8660. Re: Using the MSA a Little Differently

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-05 20:00:05 UTC
From: nealmartini
Topic: 8656 Message: 8660

Sam,

I used a coaxial relay I had because it came with SMA female connectors and was easy to plumb in without making a PCB. I added two push buttons on the front panel so I can easily switch back and forth.

Neal

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
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8661. input sw

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-05 21:47:42 UTC
From: mcmurraygrouch57
Topic: 8661 Message: 8661

```
got my package today.
thanks sam.
ron, kc0tdj
```

8662. Re: Using the MSA a Little Differently

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-05 23:02:43 UTC
From: Sam
Topic: 8656 Message: 8662

Neal,
I'm all in favor of using what's at hand. I just didn't want anyone to get the impression that your nifty idea required an expensive or complicated switch.

I also looked at the Ensemble II. It's not all that complex but if you only need it for this purpose it looks like you could eliminate about half the components--especially filter components for other bands.

Sam W.

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8663. Re: [spectrumanalyzer] Re: Using the MSA a Little Differently

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-06 16:46:08 UTC
From: Neal
Topic: 8656 Message: 8663

Sam,

I agree. Actually, you can eliminate all of the band pass filters. The cavity filter causes there to be a nice band limited signal at around 10 MHz and the Tayloe mixer does a complex spectrum down shift of this band limited signal. The Tayloe mixer is followed by a low pass filter to eliminate the other stuff that appears at the output of the MSA’s second mixer. The main reason to use this board is that it is pretty cheap and it already exists. If you eliminate all of the band pass filters, you only have to wind one very simple transformer that is used at the input to the Tayloe mixer.

Neal

From: Sam
Sent: Saturday, November 05, 2011 5:02 PM
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Re: Using the MSA a Little Differently

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8664. Re: Board Group Buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-08 04:48:26 UTC
From: Rex
Topic: 7575 Message: 8664

Does anyone have a current link for the schematics and pcb layouts for this set of boards. The links listed just give an error.

Thanks

Rex

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
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> > Jim G. Hontoria
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8665. Re: Board Group Buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-08 13:52:35 UTC
From: Sam
Topic: 7575 Message: 8665

Rex,
The schematics and PCB layouts of individual SLIM modules are here:
http://www.scottyspectrumanalyzer.com/slim.html

There are also some extras, such as the video filter, on my web site:
http://www.wetterlin.org/sam

Where did you run across the bad links?

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Rex" <r.pearson@...> wrote:
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8666. Re: Board Group Buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-08 14:03:00 UTC
From: Sam
Topic: 7575 Message: 8666

Rex,
Sorry, I'm only half awake and misinterpreted your post as relating to the main SLIM boards, rather than that particular group buy. We sent the files to everyone who bought the boards; if they were posted here they then got deleted. I'll see if I can find a copy on my computer.
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8667. Re: Board Group Buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-08 14:38:50 UTC
From: Sam
Topic: 7575 Message: 8667

Rex,
Checking through my emails I found that Jim Hontoria handled that group buy and I sent him the schematics for my boards, which are also on my web site. I do have a copy of the PCB and some schematics that I can send you, but hopefully Jim will have the complete collection, so I'll wait for his response. I think some of the boards, like the ceramic filters, don't have specific schematics. The ceramic filter is one or two filters with LC matches at input and output, so it is self-explanatory. In my photo albums I have some pictures of results with different filters.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
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8668. Input Switch Group Buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-08 16:16:07 UTC
From: Sam
Topic: 8668 Message: 8668

I have been notified that many US participants have received their boards, as well as the UK distributor for Europe. Other US participants don't need to notify me of receipt, but should notify me by email if they don't get their package by the end of the week.
Sam W.

8669. Re: [spectrumanalyzer] Re: Board Group Buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-08 18:13:11 UTC
From: Jurgen
Topic: 7575 Message: 8669

Sam,

Do you remember which value you used to replace C25 100 pF of MXR-1. I remember from past emails that this was done to extend low end frequency response?!
Was there a corresponding change for MXR-2 C25 100 pF.

Jurgen

On 11/8/2011 8:52 AM, Sam wrote:
>
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> <mailto:spectrumanalyzer%40yahoogroups.com>, "Rex" <r.pearson@...> wrote:
> >
> > Does anyone have a current link for the schematics and pcb layouts
> for this set of boards. The links listed just give an error.
> >
> > Thanks
> >
> > Rex
> >
> > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
> > >
> > > On the topic of the diplexer: It contains an attenuator that was
> intended to approximate in 2G the loss that occurs in 1G when the
> signal passes through the cavity filter and Mixer 2, which get
> bypassed by the 10.7 MHz signal in 2G. If you don't do that, it may be
> possible for the 2G signal to overload the IF amplifier.
> > >
> > > I believe I originally counted on some attenuation occurring at
> the Mixer 1 output, where the 10.7 MHz signal has to pass through a
> small capacitor (100 pF I believe), so I made the resistive attenuator
> a bit smaller than it would otherwise have to be. Later on, I think I
> replaced the Mixer 1 output capacitor with a larger one, but never

> tweaked the diplexer attenuator. That was all long ago.
> > >
> > > Bottom line, it's up to you to figure out the proper attenuation
> in the diplexer.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Jim Hontoria <jghalpha@>
> wrote:
> > > >
> > > > The diplexer documentation is in Sam Weterlin's web site.
> > > > The "zapper" is at Scotty's. I think he calls it the zero
> reponse buffer
> > > > amplifier and it is the same boardas the IF amplifier but with
> different
> > > > components.
> > > >
> > > > Jim
> > > >
> > > >
> > > > On Sat, Feb 26, 2011 at 2:33 PM, Steve <steve65@> wrote:
> > > >
> > > > >
> > > > >
> > > > > Jim,
> > > > >
> > > > > Received the MSA filter-plus PWB this week. Thanks for
> organizing the buy.
> > > > >
> > > > > Did the two documents in your email below get revised when the
> diplexer
> > > > > and zero response zapper were added to the board? If so, I
> evidently
> > > > > missed them. Where could I find them?
> > > > >
> > > > > Just trying to acquire the PWB documentation so I'll have it
> when I want
> > > > > to use the board.
> > > > >
> > > > > 73,
> > > > >
> > > > > Steve K8JQ
> > > > >
> > > > > On 2/5/2011 10:07 PM, Jim Hontoria wrote:
> > > > > > [Attachment(s) <#TopText> from Jim Hontoria included below]
> > > > > >
> > > > > > Hi everyone:
> > > > > > Please see attached two documents: One of them contains a
> description

> > > > > > of the February 2011 group buy (this very same), the other
> one has all
> > > > > > the individual pcb and sch files. This group buy started as
> filter
> > > > > > collection but by popular demand has grown t something
> larger. In
> > > > > > summary what we have is a board consisting on the following:
> > > > > >
> > > > > > 2each 5 pole filters
> > > > > > >
> > > > > > 1 each 4 pole filter
> > > > > > >
> > > > > > 1 each amplifilter
> > > > > > >
> > > > > > 2 each ceramic filters
> > > > > > >
> > > > > > 4 each lo/hi pass filters
> > > > > > >
> > > > > > 1 step recovery diode board
> > > > > > >
> > > > > > 1 each updated video filter switch board
> > > > > > >
> > > > > > 1 each updated W1JGH power meter
> > > > > > >
> > > > > > 1 each Hi-Impedance bridge
> > > > > > >
> > > > > > 1 VGA board for log detector
> > > > > > >
> > > > > > 1 High isolation SPDT
> > > > > > >
> > > > > > 1 VHF Transmission/Reflection switch
> > > > > > >
> > > > > > 1 AADE accessory board to measure SMDs
> > > > > > >
> > > > > > Some boards are entirely new, others are updates and a good
> number of
> > > > > > them are experimental.
> > > > > > >
> > > > > > Read the attached documentation for further details and how
> to order.
> > > > > > >
> > > > > > (Sorry for the highlighting, I don't seem to be avble to get
> rid of it)
> > > > > > >
> > > > > > >
> > > > > > Jim W1JGH
> > > > > > >
> > > > > > >
> > > > > > Attachment(s) from Jim Hontoria
> > > > > > >

> > > > > > 2 of 2 File(s)
> > > > > >
> > > > > > Feb11 MSA Group Buy Files.zip
> > > > > > <
> > > > >
> http://xa.yimg.com/kq/groups/11973596/1947647700/name/Feb11%20MSA%20Group%20Buy%20Files%2Ezip<http://xa.yimg.com/kq/groups/11973596/1947647700/name/Feb11%20MSA%20Group%20Buy%20Files.zip>
> > > > > >
> > > > > > Feb11 MSA Group Buy.zip
> > > > > > <
> > > > >
> http://xa.yimg.com/kq/groups/11973596/2017205051/name/Feb11%20MSA%20Group%20Buy%2Ezip<http://xa.yimg.com/kq/groups/11973596/2017205051/name/Feb11%20MSA%20Group%20Buy.zip>
> > > > > >
> > > > > >
> > > > > >
> > > > >
> > > > > --
> > > > > Read The Patriot Post Vertitas vos Liberabit
> > > > > http://patriotpost.us/subscription/
> > > > > >
> > > > >
> > > > >
> > > >
> > > >
> > > >
> > > > --
> > > > Jim G. Hontoria
> > > >
> > >
> >
>
>

8670. Mixer 1 output cap

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-08 18:26:59 UTC
From: Sam
Topic: 7575 Message: 8670

This capacitor issue is only relevant to Mixer 1, and only if you want to implement the 2G band.

The issue has to do with the 2G band, where Mixer 1 needs to output 10.7 MHz rather than the usual 1+ GHz. Originally, I left the 100 pF resistor in place and put a relatively small attenuator in the diplexer, and it worked fine. Later, I replaced the 100 pF resistor--with 0.001 uF, I think--and intended to increase the diplexer attenuation, though I never got around to that. Still works fine. Ideally, the strength of the 10.7 MHz signal at the diplexer output in 2G should roughly equal that at the Mixer 2 output in 1G. That assures you get max range with 2G without overloading the IF2 amp and losing the high end.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> Sam,
>
> Do you remember which value you used to replace C25 100 pF of MXR-1. I
> remember from past emails that this was done to extend low end frequency
> response?!
> Was there a corresponding change for MXR-2 C25 100 pF.
>
> Jurgen

8671. COAX FILTERS for sale

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-08 23:43:30 UTC
From: spyker49
Topic: 8671 Message: 8671

Hello Group.

I have had several requests asking if I had any more MSA coax filters for sale. No stock, so I plan to make another 10+.

Kits U$50. Complete and tested U$80.
Shipping from Australia typically $15 to US and Europe.
Target delivery date: January 2012.
PayPal money only at shipping time.

Please help reduce group ME TOO message clutter:
Please only reply to my email: redmond2@...

I have sold 30 coax filters so far.
See my group files for photos and kit build instructions.

Regards Len Spyker. redmond2@...

8672. Re: Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-09 00:53:07 UTC
From: Steve
Topic: 8672 Message: 8672

Has anyone developed a parts list for these PWB's that you'd be willing to share? Perhaps a text file similar in format to the parts lists for the SLIM's on Scotty's web site?

Thanks.

Steve K8JQ

steve65 at suddenlink.net

On 11/5/2011 8:18 PM, Sam Wetterlin wrote:
> Hi All,
> To clarify a couple of things:
> 1. Resistors and capacitors are all 0805 except the tantalum capacitor
> in the ERA amp module, and one or two of the resistors in that module.
> If in doubt, you can double click on the pads in the layout and it
> will tell you the size.
> 2. The relays are all 12 V. For anyone buying their own, the 9V model
> would also work. Also, there is the G6Z-1F and G6Z-1FE model, which
> have their outputs on opposite sides. The PCB accomodates either, but
> if you use the -1F rather than the -1FE there is a trace you have to
> cut, per the documentation.
> 3. US participants have started to receive their packages.
> Sam W.

--
Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

8673. Re: Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-09 02:00:40 UTC
From: Sam
Topic: 8672 Message: 8673

I don't have a parts list, but I should point out that other than the PE4251, the 1k and 100 ohm resistors, and 0.1 uF capacitors, there aren't that many parts.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
>
> Has anyone developed a parts list for these PWB's that you'd be willing
> to share? Perhaps a text file similar in format to the parts lists for
> the SLIM's on Scotty's web site?
>
> Thanks.
>
> Steve K8JQ
>
> steve65 at suddenlink.net
>
> On 11/5/2011 8:18 PM, Sam Wetterlin wrote:
> > Hi All,
> > To clarify a couple of things:
> > 1. Resistors and capacitors are all 0805 except the tantalum capacitor
> > in the ERA amp module, and one or two of the resistors in that module.
> > If in doubt, you can double click on the pads in the layout and it
> > will tell you the size.
> > 2. The relays are all 12 V. For anyone buying their own, the 9V model
> > would also work. Also, there is the G6Z-1F and G6Z-1FE model, which
> > have their outputs on opposite sides. The PCB accomodates either, but
> > if you use the -1F rather than the -1FE there is a trace you have to
> > cut, per the documentation.
> > 3. US participants have started to receive their packages.
> > Sam W.
>
> --
> Read The Onion
>

8674. Re: Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-09 03:51:14 UTC
From: Steve
Topic: 8672 Message: 8674

Sam,

Where is the layout referenced in number 1 below?

Steve K8JQ

On 11/5/2011 8:18 PM, Sam Wetterlin wrote:
> Hi All,
> To clarify a couple of things:
> 1. Resistors and capacitors are all 0805 except the tantalum capacitor
> in the ERA amp module, and one or two of the resistors in that module.
> If in doubt, you can double click on the pads in the layout and it
> will tell you the size.
> 2. The relays are all 12 V. For anyone buying their own, the 9V model
> would also work. Also, there is the G6Z-1F and G6Z-1FE model, which
> have their outputs on opposite sides. The PCB accomodates either, but
> if you use the -1F rather than the -1FE there is a trace you have to
> cut, per the documentation.
> 3. US participants have started to receive their packages.
> Sam W.

--
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http://patriotpost.us/subscription/

8675. Re: [spectrumanalyzer] Re: Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-09 03:54:41 UTC
From: Steve
Topic: 8672 Message: 8675

Hi Sam,

I understand your point. It's helpful to me to have a list on which I can check off components as I put them on the board. Helps me keep organized. Thought I might find them already made :-)

Thanks.

Steve K8JQ

On 11/8/2011 9:00 PM, Sam wrote:
> I don't have a parts list, but I should point out that other than the PE4251, the 1k and 100 ohm resistors, and 0.1 uF capacitors, there aren't that many parts.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Steve<steve65@...> wrote:
>> Has anyone developed a parts list for these PWB's that you'd be willing
>> to share? Perhaps a text file similar in format to the parts lists for
>> the SLIM's on Scotty's web site?
>>
>> Thanks.
>>
>> Steve K8JQ
>>
>> steve65 at suddenlink.net
>>
>> On 11/5/2011 8:18 PM, Sam Wetterlin wrote:
>>> Hi All,
>>> To clarify a couple of things:
>>> 1. Resistors and capacitors are all 0805 except the tantalum capacitor
>>> in the ERA amp module, and one or two of the resistors in that module.
>>> If in doubt, you can double click on the pads in the layout and it
>>> will tell you the size.
>>> 2. The relays are all 12 V. For anyone buying their own, the 9V model
>>> would also work. Also, there is the G6Z-1F and G6Z-1FE model, which
>>> have their outputs on opposite sides. The PCB accomodates either, but
>>> if you use the -1F rather than the -1FE there is a trace you have to
>>> cut, per the documentation.
>>> 3. US participants have started to receive their packages.
>>> Sam W.
>> --
>> Read The Onion
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> Yahoo! Groups Links
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8676. Re: Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-09 11:58:16 UTC
From: Sam
Topic: 8672 Message: 8676

I guess I forgot to email the actual ExpressPCB files, which I have just now done.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
>
> Sam,
>
> Where is the layout referenced in number 1 below?
>
> Steve K8JQ
>
> On 11/5/2011 8:18 PM, Sam Wetterlin wrote:
> > Hi All,
> > To clarify a couple of things:
> > 1. Resistors and capacitors are all 0805 except the tantalum capacitor
> > in the ERA amp module, and one or two of the resistors in that module.
> > If in doubt, you can double click on the pads in the layout and it
> > will tell you the size.
> > 2. The relays are all 12 V. For anyone buying their own, the 9V model
> > would also work. Also, there is the G6Z-1F and G6Z-1FE model, which
> > have their outputs on opposite sides. The PCB accomodates either, but
> > if you use the -1F rather than the -1FE there is a trace you have to
> > cut, per the documentation.
> > 3. US participants have started to receive their packages.
> > Sam W.
>
> --

8677. Forward/reverse switch . . . a couple of questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-11 02:38:10 UTC
From: Steve
Topic: 8677 Message: 8677

Hi Sam,

Looking at the .pcb file for the forward/reverse switch. Some resistors (such as R92, R93, R94) have the notation "Long--For use as jumper" in the Name field of the Component Properties screen. Other components have an "SEW" notation.

What does "Long--For use as jumper" mean? What does "SEW" mean?

Also, the schematic in the pdf should probably identify the PE4251's as U1, U2, U3 and U4 rather than just "U"?

Did you have in mind to provide +10VDC for this PWB from the control board?

Thanks.

Steve K8JQ

8678. NDK filter data

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-11 10:32:03 UTC
From: sfcillari
Topic: 8678 Message: 8678

If someone needs data about NDK filters:

http://www.datasheetarchive.com/10P15DA-datasheet.html

I just bought a couple of 10p17d filters and used a 3uH inductor with a cap of 56p and a 60p trimmer to match the 910ohm/25p input. I still have a rippel of about 2db but the attenuation is good at 90db.
Are there any clever tricks to smooth the rippel?

See also the scan in files section....

Simon

8679. Re: Forward/reverse switch . . . a couple of questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-11 11:23:22 UTC
From: Sam
Topic: 8677 Message: 8679

Hi Steve,
Yes, the +10 comes from the control board. The U's should be numbered. "SEW" are my initials, to distinguish the standard ExpressPCB footprints from my modifications, and the jumper reference is for a slightly elongated 0805 footprint that makes it easier for a trace to run between the pads.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
>
> Hi Sam,
>
> Looking at the .pcb file for the forward/reverse switch. Some resistors
> (such as R92, R93, R94) have the notation "Long--For use as jumper" in
> the Name field of the Component Properties screen. Other components have
> an "SEW" notation.
>
> What does "Long--For use as jumper" mean? What does "SEW" mean?
>
> Also, the schematic in the pdf should probably identify the PE4251's as
> U1, U2, U3 and U4 rather than just "U"?
>
> Did you have in mind to provide +10VDC for this PWB from the control board?
>
> Thanks.
>
> Steve K8JQ
>

8680. Re: NDK filter data

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-11 11:53:31 UTC
From: Sam
Topic: 8678 Message: 8680

That explains some things. First, they do have internal transformers. Second, the terminating impedance is 910 ohms || 25p, which I think is different from the eBay seller info. And while the data sheet graphs look pretty smooth, they do have a spec of 2 dB ripple.

Ordinarily, reducing the ripple is a matter of getting the impedance match right, but I think you're just lucky if you can get it much below the level of the spec. I think the ripple is caused by the fact that the various crystals are tuned to slightly different frequencies to cover the bandwidth.

Ripple seems to be a bigger problem for 7.5 kHz and 15 kHz crystal filters than for narrower ones. If the ripple forms a peak right in the middle, it's not so bad, but otherwise it is irritating. Ceramic filters can be a bit mis-shapen, but don't usually have much ripple, but start at about 30 kHz. To minimize ripple, I used a 2 kHz filter and then skipped to 30 kHz ceramic. (Plus the Amplifilter for very narrow RBW, and a 400 kHz ceramic.)

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "sfcillari" <sf-cillari@...> wrote:
>
> If someone needs data about NDK filters:
>
> http://www.datasheetarchive.com/10P15DA-datasheet.html
>
> I just bought a couple of 10p17d filters and used a 3uH inductor with a cap of 56p and a 60p trimmer to match the 910ohm/25p input. I still have a rippel of about 2db but the attenuation is good at 90db.
> Are there any clever tricks to smooth the rippel?
>
> See also the scan in files section....
>
> Simon
>

8681. Re: Forward/reverse switch . . . a couple of questions

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-11 12:02:00 UTC
From: Sam
Topic: 8677 Message: 8681

The four PE4251 on the F/R switch schematic should be numbered with the upper left one being U1, lower left U2, upper right U3 and lower right U4. Thus, U1 has resistors and capacitors labeled R1x and C1x, etc. They are numbered correctly on the PCB layout.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Hi Steve,
> Yes, the +10 comes from the control board. The U's should be numbered. "SEW" are my initials, to distinguish the standard ExpressPCB footprints from my modifications, and the jumper reference is for a slightly elongated 0805 footprint that makes it easier for a trace to run between the pads.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Steve <steve65@> wrote:
> >
> > Hi Sam,
> >
> > Looking at the .pcb file for the forward/reverse switch. Some resistors
> > (such as R92, R93, R94) have the notation "Long--For use as jumper" in
> > the Name field of the Component Properties screen. Other components have
> > an "SEW" notation.
> >
> > What does "Long--For use as jumper" mean? What does "SEW" mean?
> >
> > Also, the schematic in the pdf should probably identify the PE4251's as
> > U1, U2, U3 and U4 rather than just "U"?
> >
> > Did you have in mind to provide +10VDC for this PWB from the control board?
> >
> > Thanks.
> >
> > Steve K8JQ
> >
>

8682. Re: [spectrumanalyzer] NDK filter data

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-11 21:37:55 UTC
From: william sprowls
Topic: 8678 Message: 8682

Hi Simon,
I notice that the 10p17d is not in their list. Assuming that it does have a terminating impedance of 910ohm/25p, then you want a total of 3.08 uH and 67.8 pfd. The 25 pfd of the filter must be included in the 67.8 pfd shunt capacitor. Therefore, you need to add only (67.8 - 25 =) 42.8 pf. with your 3 uH.
Scotty

--- On Fri, 11/11/11, sfcillari <sf-cillari@hetnet.nl> wrote:

From: sfcillari <sf-cillari@...>
Subject: [spectrumanalyzer] NDK filter data
To: spectrumanalyzer@yahoogroups.com
Date: Friday, November 11, 2011, 4:32 AM

If someone needs data about NDK filters:

http://www.datasheetarchive.com/10P15DA-datasheet.html

I just bought a couple of 10p17d filters and used a 3uH inductor with a cap of 56p and a 60p trimmer to match the 910ohm/25p input. I still have a rippel of about 2db but the attenuation is good at 90db.

Are there any clever tricks to smooth the rippel?

See also the scan in files section....

Simon

8683. Re: NDK filter data

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-11 22:00:49 UTC
From: Rex
Topic: 8678 Message: 8683

Hi Simon

I am using the NDK10P17D filter and have attached the filter plots for your reference.

I used toroids for the inductors and both took off turns and adjusted turn spacing to get an exact match. I also used 47p fixed caps and 60pf variables for the matching caps. Once I had got in the ball park the spacing of turns (inductance adjustment) became critical to optimise the ripple. The initial design value of the toroids was 3.5uH but I took off several turns so I guess they would be close to 3uH.

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/773230570/pic/649314967/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/773230570/pic/480851200/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

Rex

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Simon,
> I notice that the 10p17d is not in their list. Assuming that it does have a terminating impedance of 910ohm/25p, then you want a total of 3.08 uH and 67.8 pfd. The 25 pfd of the filter must be included in the 67.8 pfd shunt capacitor. Therefore, you need to add only (67.8 - 25 =) 42.8 pf. with your 3 uH.
> Scotty
>
> --- On Fri, 11/11/11, sfcillari <sf-cillari@...> wrote:
>
> From: sfcillari <sf-cillari@...>
> Subject: [spectrumanalyzer] NDK filter data
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, November 11, 2011, 4:32 AM
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> If someone needs data about NDK filters:
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>
> http://www.datasheetarchive.com/10P15DA-datasheet.html
>
>
>
> I just bought a couple of 10p17d filters and used a 3uH inductor with a cap of 56p and a 60p trimmer to match the 910ohm/25p input. I still have a rippel of about 2db but the attenuation is good at 90db.
>
> Are there any clever tricks to smooth the rippel?
>
>
>
> See also the scan in files section....
>
>
>
> Simon
>

8684. Re: NDK filter data

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-12 01:36:28 UTC
From: Sam
Topic: 8678 Message: 8684

That is a very nice response. Not much ripple, and what there is peaks in the middle.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Rex" <r.pearson@...> wrote:
>
> Hi Simon
>
> I am using the NDK10P17D filter and have attached the filter plots for your reference.
>
> I used toroids for the inductors and both took off turns and adjusted turn spacing to get an exact match. I also used 47p fixed caps and 60pf variables for the matching caps. Once I had got in the ball park the spacing of turns (inductance adjustment) became critical to optimise the ripple. The initial design value of the toroids was 3.5uH but I took off several turns so I guess they would be close to 3uH.
>
>
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/773230570/pic/649314967/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc
>
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/773230570/pic/480851200/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc
>
> Rex
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> >
> > Hi Simon,
> > I notice that the 10p17d is not in their list. Assuming that it does have a terminating impedance of 910ohm/25p, then you want a total of 3.08 uH and 67.8 pfd. The 25 pfd of the filter must be included in the 67.8 pfd shunt capacitor. Therefore, you need to add only (67.8 - 25 =) 42.8 pf. with your 3 uH.
> > Scotty
> >
> > --- On Fri, 11/11/11, sfcillari <sf-cillari@> wrote:
> >
> > From: sfcillari <sf-cillari@>
> > Subject: [spectrumanalyzer] NDK filter data
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Friday, November 11, 2011, 4:32 AM
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> >
> > If someone needs data about NDK filters:
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> >
> > http://www.datasheetarchive.com/10P15DA-datasheet.html
> >
> >
> >
> > I just bought a couple of 10p17d filters and used a 3uH inductor with a cap of 56p and a 60p trimmer to match the 910ohm/25p input. I still have a rippel of about 2db but the attenuation is good at 90db.
> >
> > Are there any clever tricks to smooth the rippel?
> >
> >
> >
> > See also the scan in files section....
> >
> >
> >
> > Simon
> >
>

8685. Re: NDK filter data

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-12 18:14:28 UTC
From: sfcillari
Topic: 8678 Message: 8685

Hi all,

I followed rex's advice and replaced the inductors for some toroids. I measured them at about 3,3uh. This immediatly gave better results. After adding some windings and some fine tuning I got the ripple below 1db. See also the file 10p17d-tuned in the files section. I know this filter is not in the list but I think that I can conclude it has the same 910ohm/25pF impedance. Also the caps are very close too the calculated ones, 33pF+60pF trimmer 30% turned in.

This tuning requires a lot of patience and you really have to zoom in to iron out the ripples.....

Thanks for the replies,

Simon

> >
> > I used toroids for the inductors and both took off turns and adjusted turn spacing to get an exact match. I also used 47p fixed caps and 60pf variables for the matching caps. Once I had got in the ball park the spacing of turns (inductance adjustment) became critical to optimise the ripple. The initial design value of the toroids was 3.5uH but I took off several turns so I guess they would be close to 3uH.

8686. Re: NDK filter data

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-12 19:01:32 UTC
From: Sam
Topic: 8678 Message: 8686

It struck me as odd that the manufacturer includes internal transformers but leaves the impedance at such a high level. But I guess all they were trying to accomplish is to make all the filters have the same impedance, and it makes sense that your model would also have that impedance.

Yes, the tuning of these filters is very sensitive when you are trying to minimize the ripple.

I'll remind people of a potential problem soldering the canned filters. My first one I tried to solder all the way around to the PCB; I later concluded that if the filter sits down flat on the board you don't need 100% coverage. In any event, it is possible while soldering to melt the hermetic seal on the case, and heat the air inside so some of it bubbles out. Then when it cools it can suck the melted solder inside, possibly shorting out something inside (on mine it did short out). I discovered that there is a small hole in the can that is soldered over. Closing that hole must be the last thing in the manufacturing process, to avoid the sucking problem. The first thing you should do is remove the solder from the hole, then solder the case to the PCB, then close the hole.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "sfcillari" <sf-cillari@...> wrote:
>
> Hi all,
>
> I followed rex's advice and replaced the inductors for some toroids. I measured them at about 3,3uh. This immediatly gave better results. After adding some windings and some fine tuning I got the ripple below 1db. See also the file 10p17d-tuned in the files section. I know this filter is not in the list but I think that I can conclude it has the same 910ohm/25pF impedance. Also the caps are very close too the calculated ones, 33pF+60pF trimmer 30% turned in.
>
> This tuning requires a lot of patience and you really have to zoom in to iron out the ripples.....
>
> Thanks for the replies,
>
> Simon
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> > >
> > > I used toroids for the inductors and both took off turns and adjusted turn spacing to get an exact match. I also used 47p fixed caps and 60pf variables for the matching caps. Once I had got in the ball park the spacing of turns (inductance adjustment) became

critical to optimise the ripple. The initial design value of the toroids was 3.5uH but I took off several turns so I guess they would be close to 3uH.
>

8687. Forward/reverse switch and input switch PWB capacitors

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-13 18:49:06 UTC
From: Steve
Topic: 8687 Message: 8687

Sam,

With the exception of the tantalum's on the input switch board, are ceramic capacitors OK for everywhere else on these PWB's?

Thanks.

Steve K8JQ

--
Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

8688. Re: Forward/reverse switch and input switch PWB capacitors

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-13 19:51:51 UTC
From: Sam
Topic: 8687 Message: 8688

Yes, but not the ceramic types that start with Y or Z.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
>
> Sam,
>
> With the exception of the tantalum's on the input switch board, are
> ceramic capacitors OK for everywhere else on these PWB's?
>
> Thanks.
>
> Steve K8JQ
>
> --
> Read The Patriot Post Vertitas vos Liberabit
> http://patriotpost.us/subscription/
>

8689. Re: [spectrumanalyzer] Re: Forward/reverse switch and input switch PWB capacitors

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-13 23:02:57 UTC
From: Steve
Topic: 8687 Message: 8689

Thanks. I either have or am looking to get X7R or X5R types, 10% or 20% tolerance. A few will be C0G. Looks like I'm on the right track.

Steve K8JQ

On 11/13/2011 2:51 PM, Sam wrote:
> Yes, but not the ceramic types that start with Y or Z.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Steve<steve65@...> wrote:
>> Sam,
>>
>> With the exception of the tantalum's on the input switch board, are
>> ceramic capacitors OK for everywhere else on these PWB's?
>>
>> Thanks.
>>
>> Steve K8JQ
>>
>> --
>> Read The Patriot Post Vertitas vos Liberabit
>> http://patriotpost.us/subscription/
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> Yahoo! Groups Links
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Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

8690. Re: Forward/reverse switch and input switch PWB capacitors

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-14 00:12:11 UTC
From: Sam
Topic: 8687 Message: 8690

Steve,
Up to 1 nF, NP0/COG is the way to go. I think you can even go to 10 nF, but they start to get more expensive. Above that, go with X7R until you get to large sizes (maybe 1 uF) and then X5R become a better deal.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
>
> Thanks. I either have or am looking to get X7R or X5R types, 10% or 20%
> tolerance. A few will be C0G. Looks like I'm on the right track.
>
> Steve K8JQ
>
> On 11/13/2011 2:51 PM, Sam wrote:
> > Yes, but not the ceramic types that start with Y or Z.
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, Steve<steve65@> wrote:
> >> Sam,
> >>
> >> With the exception of the tantalum's on the input switch board, are
> >> ceramic capacitors OK for everywhere else on these PWB's?
> >>
> >> Thanks.
> >>
> >> Steve K8JQ
> >>
> >> --

8691. Coax Relays

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-14 00:24:36 UTC
From: Sam
Topic: 8691 Message: 8691

For anyone interested in coax relays for switching functions, such as the input switch or band switch, there are presently listed on eBay three items that have two 12V relays (they work fine at 10V) connected with coax, and an attenuator thrown in for good measure, now bid at $24.99 wit one day to go. Search for SMA relay and you will find them. If you want to see everything available, search for SMA relay and SMA switch.

The vast majority of available coax relays seem to be 24V or 28V. If you want to use that type, my 23V power supply board may provide the voltage you need. If not, a simple resistor change can increase the voltage (but you will also need higher voltage capacitors--35V vs. 25V).

Sam W.

8692. Xmas cleaning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-14 13:21:44 UTC
From: Dan Andersson
Topic: 8692 Message: 8692

Hi All,

I found 2 "Prologix GPIB-USB Controllers" I bought for a project eralier when cleaning up my shack.
(I couldn't even place an A4 paper flat on any surface in the shack...)

One of them is brand new and never used.

I don't need two of them so one is going.

Any one interested in the SA group before I put it on Ebay? As a comparison, Price for new ones are 94 quid plus Customs Duty and VAT in the UK. Any offers will be taken seriously as long as PayPal works.

DIRECT EMAILS please

//Dan, M0DFI

8693. Re: Xmas cleaning

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-14 17:16:36 UTC
From: Dan Andersson
Topic: 8692 Message: 8693

Gone.

Tnx for the interest!

//Dan

8694. Cavity filter test results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-15 18:36:21 UTC
From: Jurgen
Topic: 8694 Message: 8694

I build my cavity filter using a 1" copper tube on the outside. The rest is made of brass.

Here are my cavity filter test results:

Attenuation 5.8 dB
Bandwidth 2.9 MHz at 6dB
Center frequency 1013.3 MHz

How does this compare to the rest of you.

Thanks, Jurgen

8695. Re: [spectrumanalyzer] Cavity filter test results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-15 20:04:05 UTC
From: w4zcb
Topic: 8694 Message: 8695

Hi Jurgen. I've made a half dozen of these with all copper construction (One silver plated and no noticeable difference) Mine have measured about another 2 dB of attenuation, and about 0.8 MHz narrower in bandwidth. I would estimate yours to be more than adequate.

W4ZCB

>I build my cavity filter using a 1" copper tube on the outside. The
>rest
> is made of brass.
>
> Here are my cavity filter test results:
>
> Attenuation 5.8 dB
> Bandwidth 2.9 MHz at 6dB
> Center frequency 1013.3 MHz
>
> How does this compare to the rest of you.
>
> Thanks, Jurgen
>

8696. Re: Cavity filter test results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-15 20:36:22 UTC
From: Sam
Topic: 8694 Message: 8696

That sounds very good. You measured the bandwidth at 6 dB rather than 3 dB, which might make it hard to compare with others. In any event, the critical parameter is how much attenuation you get at 1013.3+21.4 MHz, because that is the image you are trying to reject. 90 dB below the peak is the target.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> I build my cavity filter using a 1" copper tube on the outside. The rest
> is made of brass.
>
> Here are my cavity filter test results:
>
> Attenuation 5.8 dB
> Bandwidth 2.9 MHz at 6dB
> Center frequency 1013.3 MHz
>
> How does this compare to the rest of you.
>
> Thanks, Jurgen
>

8697. Mini-Circuits quote

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-15 21:04:49 UTC
From: neganur
Topic: 8697 Message: 8697

How does the Mini-Circuits quote work, do I call the phone number stated on the quote (number in Brooklyn) and ask for the Amateur Spectrum Analyzer Kit KXMA-1+ ?

I just realised that this quote is incredible. When I ordered parts for my prototype at Mini-Circuits Europe I paid 140 EUR* (= 193 USD). That was without the transformer which was out of stock at the time and without the mixers, too.

(*: I paid 20 EUR freight charges and 20% VAT on top of it all = 140 EUR)

Right now I'm about to order 2 x ROS-2150, 1 x ROS-1500 and 5 x ADE-11X and already sit at 120 EUR (= 166 USD) without freight and tax. Made me wonder if I should call the Brooklyn number and ask.

8698. Re: [spectrumanalyzer] Mini-Circuits quote

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-15 21:51:26 UTC
From: Christian Cziezerski
Topic: 8697 Message: 8698

For what it's worth, I just noticed that I may as well buy a lot of 25 of the mixers. The price is almost the same as for 5.

On Tue, Nov 15, 2011 at 11:04 PM, neganur <neganur@...> wrote:

> **
>
>
> [...]Right now I'm about to order 2 x ROS-2150, 1 x ROS-1500 and 5 x
> ADE-11X[...]
>
>

8699. Re: [spectrumanalyzer] Re: Cavity filter test results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-15 22:05:54 UTC
From: Jurgen
Topic: 8694 Message: 8699

I will repeat the bandwidth measurement at 3dB.
I don't have a level meter to measure the attenuation at +21.4 MHz.
Will just have to see how it works with the rest of the circuit.

Thanks, Jurgen

On 11/15/2011 3:36 PM, Sam wrote:
>
> That sounds very good. You measured the bandwidth at 6 dB rather than
> 3 dB, which might make it hard to compare with others. In any event,
> the critical parameter is how much attenuation you get at 1013.3+21.4
> MHz, because that is the image you are trying to reject. 90 dB below
> the peak is the target.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@...> wrote:
> >
> > I build my cavity filter using a 1" copper tube on the outside. The
> rest
> > is made of brass.
> >
> > Here are my cavity filter test results:
> >
> > Attenuation 5.8 dB
> > Bandwidth 2.9 MHz at 6dB
> > Center frequency 1013.3 MHz
> >
> > How does this compare to the rest of you.
> >
> > Thanks, Jurgen
> >
>
>

8700. Re: [spectrumanalyzer] Mini-Circuits quote

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-15 22:26:19 UTC
From: Robert Fish
Topic: 8697 Message: 8700

That's the way I did it. I think there is a copy of the quote in the files section of our group. You should refer to the quote number. As I recall, when I did it, the quote had expired. I had them renew it, they had to run it through channels, but it was approved. This was a year or two ago, so I hope it is still good. If they say it has expired, ask if you can have it renewed, it worked for me.

Bob K6GGO

>
> How does the Mini-Circuits quote work, do I call the phone number
> stated on the quote (number in Brooklyn) and ask for the Amateur
> Spectrum Analyzer Kit KXMA-1+ ?
>
> I just realised that this quote is incredible. When I ordered parts
> for my prototype at Mini-Circuits Europe I paid 140 EUR* (= 193 USD).
> That was without the transformer which was out of stock at the time
> and without the mixers, too.
>
> (*: I paid 20 EUR freight charges and 20% VAT on top of it all = 140 EUR)
>
> Right now I'm about to order 2 x ROS-2150, 1 x ROS-1500 and 5 x
> ADE-11X and already sit at 120 EUR (= 166 USD) without freight and
> tax. Made me wonder if I should call the Brooklyn number and ask.
>
>

8701. Re: [spectrumanalyzer] Re: Cavity filter test results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-15 22:56:04 UTC
From: william sprowls
Topic: 8694 Message: 8701

Hi Jurgen,
 Once you have the cavity installed in the MSA, the attenuation test at 1013.3 + 21.4 MHz is very easy. You don't need any other equipment.
Scotty

--- On Tue, 11/15/11, Jurgen <khj221@...> wrote:

From: Jurgen <khj221@...>
Subject: Re: [spectrumanalyzer] Re: Cavity filter test results
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, November 15, 2011, 4:05 PM

I will repeat the bandwidth measurement at 3dB.

I don't have a level meter to measure the attenuation at +21.4 MHz.

Will just have to see how it works with the rest of the circuit.

Thanks, Jurgen

On 11/15/2011 3:36 PM, Sam wrote:

That sounds very good. You measured the bandwidth at 6 dB
rather than 3 dB, which might make it hard to compare with
others. In any event, the critical parameter is how much
attenuation you get at 1013.3+21.4 MHz, because that is
the image you are trying to reject. 90 dB below the peak
is the target.

Sam W.

--- In spectrumanalyzer@yahoogroups.com,
Jurgen <khj221@...> wrote:

>

> I build my cavity filter using a 1" copper tube on
the outside. The rest

> is made of brass.

>

> Here are my cavity filter test results:

>

> Attenuation 5.8 dB

> Bandwidth 2.9 MHz at 6dB

> Center frequency 1013.3 MHz

>

> How does this compare to the rest of you.

>

> Thanks, Jurgen

>

8702. Re: Cavity filter test results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-15 23:23:24 UTC
From: Sam
Topic: 8694 Message: 8702

I would guess from the fact that you have decent loss and an OK bandwidth even when measured at 6 db, that your 3 dB bandwidth and the attenuation at +21.4 MHz will be good. As Scotty says, you can verify this when you get everything put together.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Jurgen,
> Â Once you have the cavity installed in the MSA, the attenuation test at 1013.3 + 21.4 MHz is very easy. You don't need any other equipment.
> Scotty
>
> --- On Tue, 11/15/11, Jurgen <khj221@...> wrote:
>
> From: Jurgen <khj221@...>
> Subject: Re: [spectrumanalyzer] Re: Cavity filter test results
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, November 15, 2011, 4:05 PM
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> I willÂ repeat the bandwidth measurement at 3dB.
>
> I don't have a level meter to measure the attenuation at +21.4 MHz.
>
> Will just have to see how it works with the rest of the circuit.
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>
> Thanks, Jurgen
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> On 11/15/2011 3:36 PM, Sam wrote:
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> Â
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>
> That sounds very good. You measured the bandwidth at 6 dB
> rather than 3 dB, which might make it hard to compare with
> others. In any event, the critical parameter is how much
> attenuation you get at 1013.3+21.4 MHz, because that is
> the image you are trying to reject. 90 dB below the peak
> is the target.
>
> Sam W.
>
>
>
> --- In spectrumanalyzer@yahoogroups.com,
> Jurgen <khj221@> wrote:
>
> >
>
> > I build my cavity filter using a 1" copper tube on
> the outside. The rest
>
> > is made of brass.
>
> >
>
> > Here are my cavity filter test results:
>

> >
>
> > Attenuation 5.8 dB
>
> > Bandwidth 2.9 MHz at 6dB
>
> > Center frequency 1013.3 MHz
>
> >
>
> > How does this compare to the rest of you.
>
> >
>
> > Thanks, Jurgen
>
> >
>

8703. Re: [spectrumanalyzer] Mini-Circuits quote

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-15 23:46:52 UTC
From: Joel Williams
Topic: 8697 Message: 8703

In July this year, I wrote to sales at minicircuits.com and asked for 'quote 5-QT-61201-A "AMATEUR SPECTRUM ANALYZER KIT" (tel: 612-599-1261)', and a couple of other components.

Mini-Circuits have also been happy to ship via USPS when I've asked, which saves a few dollars on freight.

Joel

On 16/11/2011, at 8:56 AM, Robert Fish wrote:

> That's the way I did it. I think there is a copy of the quote in the files section of our group. You should refer to the quote number. As I recall, when I did it, the quote had expired. I had them renew it, they had to run it through channels, but it was approved. This was a year or two ago, so I hope it is still good. If they say it has expired, ask if you can have it renewed, it worked for me.
>
> Bob K6GGO
>
>>
>>
>> How does the Mini-Circuits quote work, do I call the phone number stated on the quote (number in Brooklyn) and ask for the Amateur Spectrum Analyzer Kit KXMA-1+ ?
>>
>> I just realised that this quote is incredible. When I ordered parts for my prototype at Mini-Circuits Europe I paid 140 EUR* (= 193 USD). That was without the transformer which was out of stock at the time and without the mixers, too.
>>
>> (*: I paid 20 EUR freight charges and 20% VAT on top of it all = 140 EUR)
>>
>> Right now I'm about to order 2 x ROS-2150, 1 x ROS-1500 and 5 x ADE-11X and already sit at 120 EUR (= 166 USD) without freight and tax. Made me wonder if I should call the Brooklyn number and ask.
>>

8704. Re: [spectrumanalyzer] Mini-Circuits quote

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-16 16:28:04 UTC
From: Geoff Moore
Topic: 8697 Message: 8704

Don't know which country you are located in but if you are using Euros, try the UK number. Very helpful chap I dealt with and he was very interested in the project. Something he thought was beyond the scope of homebrewers.

Geoff

----- Original Message -----
From: Robert Fish
To: spectrumanalyzer@yahoogroups.com
Sent: Tuesday, November 15, 2011 10:26 PM
Subject: Re: [spectrumanalyzer] Mini-Circuits quote

That's the way I did it. I think there is a copy of the quote in the files section of our group. You should refer to the quote number. As I recall, when I did it, the quote had expired. I had them renew it, they had to run it through channels, but it was approved. This was a year or two ago, so I hope it is still good. If they say it has expired, ask if you can have it renewed, it worked for me.

Bob K6GGO

How does the Mini-Circuits quote work, do I call the phone number stated on the quote (number in Brooklyn) and ask for the Amateur Spectrum Analyzer Kit KXMA-1+ ?

I just realised that this quote is incredible. When I ordered parts for my prototype at Mini-Circuits Europe I paid 140 EUR* (= 193 USD). That was without the transformer which was out of stock at the time and without the mixers, too.

(*: I paid 20 EUR freight charges and 20% VAT on top of it all = 140 EUR)

Right now I'm about to order 2 x ROS-2150, 1 x ROS-1500 and 5 x ADE-11X and already sit at 120 EUR (= 166 USD) without freight and tax. Made me wonder if I should call the Brooklyn number and ask.

8705. Re: [spectrumanalyzer] Mini-Circuits quote

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-16 17:45:23 UTC
From: Dan Andersson
Topic: 8697 Message: 8705

Minicircuits UK.

Try email:

"Silvia" <silvia@...>

Silvia Hranicka

Account Manager

Tel: (0044)(0)1252 832601

Fax: (0044)(0)1252 837010

Cheers All

Dan, M0DFI

On Wed, 16 Nov 2011 16:28:04 -0000
"Geoff Moore" <m0ore@...> wrote:

> Don't know which country you are located in but if you are using Euros, try the UK number. Very helpful chap I dealt with and he was very interested in the project. Something he thought was beyond the scope of homebrewers.
>
> Geoff
>
> ----- Original Message -----
> From: Robert Fish
> To: spectrumanalyzer@yahoogroups.com
> Sent: Tuesday, November 15, 2011 10:26 PM
> Subject: Re: [spectrumanalyzer] Mini-Circuits quote
>
>
>
> That's the way I did it. I think there is a copy of the quote in the files section of our group. You should refer to the quote number. As I recall, when I did it, the quote had expired. I had them renew it, they had to run it through channels, but it was approved. This was a year or two ago, so I hope it is still good. If they say it has expired, ask if you can have it renewed, it worked for me.
>
> Bob K6GGO
>
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>

> How does the Mini-Circuits quote work, do I call the phone number stated on the quote (number in Brooklyn) and ask for the Amateur Spectrum Analyzer Kit KXMA-1+ ?
>
> I just realised that this quote is incredible. When I ordered parts for my prototype at Mini-Circuits Europe I paid 140 EUR* (= 193 USD). That was without the transformer which was out of stock at the time and without the mixers, too.
>
> (*: I paid 20 EUR freight charges and 20% VAT on top of it all = 140 EUR)
>
> Right now I'm about to order 2 x ROS-2150, 1 x ROS-1500 and 5 x ADE-11X and already sit at 120 EUR (= 166 USD) without freight and tax. Made me wonder if I should call the Brooklyn number and ask.
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>
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>

8706. Re: Mini-Circuits quote

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-18 15:41:57 UTC
From: neganur
Topic: 8697 Message: 8706

Thanks for the replies. I received a quote from Mini-Circuits Europe today:

82.60 EUR for the whole kit plus 20 EUR delivery charge (excl. VAT).

The kit contains

1xROS-1500+
2x ROS-2150VW+
2x TC16-161TG2+
4xADE-11X+
10x ERA-33SM+

(I guess the additional transformer was a typo and I notified them)

I think this is an excellent offer compared to buying the components from the web store. I've asked for permission to publish the quote pdf file here in the Yahoo group once the quantities are updated.

Cheers for the help!

Chris

--- In spectrumanalyzer@yahoogroups.com, Dan Andersson <dan@...> wrote:
>
>
> Minicircuits UK.
>
> Try email:
>
> "Silvia" <silvia@...>
>
> Silvia Hranicka
>
> Account Manager
>
> Tel: (0044)(0)1252 832601
>
> Fax: (0044)(0)1252 837010
>
>
> Cheers All
>
> Dan, M0DFI

8707. Semi rigid RG402

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-18 16:58:46 UTC
From: Jurgen
Topic: 8707 Message: 8707

I am searching for Semi Rigid RG402 (0.141") with a solid outside copper tube.
Is anyone aware of a source.

Thank you, Jurgen

8708. RE: [spectrumanalyzer] Semi rigid RG402

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-18 17:59:39 UTC
From: marc olanié
Topic: 8707 Message: 8708

Hi Jurgen

Page 6 of Rota Franco's coaxial cables catalog (9 Euros per meter)
http://www.rfmicrowave.it/catalogue.php?lang=eng
if you are looking specifically for this type of cable. Most of the time, Sucoform is easier to bend and to use, with few or no differences from a technical point of view

73'
Marc f6itu

Objet : [spectrumanalyzer] Semi rigid RG402

I am searching for Semi Rigid RG402 (0.141") with a solid outside copper tube.
Is anyone aware of a source.

Thank you, Jurgen

Yahoo! Groups Links

8709. Re: Semi rigid RG402

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-18 19:35:54 UTC
From: Sam
Topic: 8707 Message: 8709

I haven't tried this place, but it looks interesting:

http://www.microstock-inc.com/newpage1.php

Look for UT-141. They have quite a variety of different coax types, including some nifty ones with very small diameters. You can buy small quantities but you have to ask for a quote, so I have no idea how the prices are.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> I am searching for Semi Rigid RG402 (0.141") with a solid outside copper
> tube.
> Is anyone aware of a source.
>
> Thank you, Jurgen
>

8710. Re: Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-18 19:49:31 UTC
From: neganur
Topic: 8672 Message: 8710

Hi!

I started populating the input switch and noticed that the PCB file doesn't match the schematic version (the PCB file version is two days older).

Additionally, R6 in the schematic is R5 on the PCB (1/4 W 100 Ohm). There is no R6 on the PCB.

The quality of the board is fantastic by the way, I was expecting the tinned solder mask-less PCB-Express style.

Chris

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I guess I forgot to email the actual ExpressPCB files, which I have just now done.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Steve <steve65@> wrote:
> >
> > Sam,
> >
> > Where is the layout referenced in number 1 below?
> >
> > Steve K8JQ
> >
> > On 11/5/2011 8:18 PM, Sam Wetterlin wrote:
> > > Hi All,
> > > To clarify a couple of things:
> > > 1. Resistors and capacitors are all 0805 except the tantalum capacitor
> > > in the ERA amp module, and one or two of the resistors in that module.
> > > If in doubt, you can double click on the pads in the layout and it
> > > will tell you the size.
> > > 2. The relays are all 12 V. For anyone buying their own, the 9V model
> > > would also work. Also, there is the G6Z-1F and G6Z-1FE model, which
> > > have their outputs on opposite sides. The PCB accomodates either, but
> > > if you use the -1F rather than the -1FE there is a trace you have to
> > > cut, per the documentation.
> > > 3. US participants have started to receive their packages.
> > > Sam W.
> >
> > --
>

8711. Re: Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-18 19:51:07 UTC
From: neganur
Topic: 8672 Message: 8711

Never mind R6, I was ignoring the board that doesn't use the relay.

--- In spectrumanalyzer@yahoogroups.com, "neganur" <neganur@...> wrote:

> Additionally, R6 in the schematic is R5 on the PCB (1/4 W 100 Ohm). There is no R6 on the PCB.
>

8712. Re: [spectrumanalyzer] Re: Semi rigid RG402

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-18 20:08:07 UTC
From: Jurgen
Topic: 8707 Message: 8712

Thanks Sam,

I did not remember UT-141. Just bought an assortment from Ebay.

Jurgen

On 11/18/2011 2:35 PM, Sam wrote:
>
> I haven't tried this place, but it looks interesting:
>
> http://www.microstock-inc.com/newpage1.php
>
> Look for UT-141. They have quite a variety of different coax types,
> including some nifty ones with very small diameters. You can buy small
> quantities but you have to ask for a quote, so I have no idea how the
> prices are.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@...> wrote:
> >
> > I am searching for Semi Rigid RG402 (0.141") with a solid outside
> copper
> > tube.
> > Is anyone aware of a source.
> >
> > Thank you, Jurgen
> >
>
>

8713. 10.7 MHz noise filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-19 13:19:02 UTC
From: marcolanie
Topic: 8713 Message: 8713

Hi

Reading the documentation of the MSA, I stumbled on this :

"The SLIM-CB-NV is designed with a Noise Filter Section. The noise filter is not required for any MSA configuration. All the components in that section can be omitted."

What was the historical reason of this filter ? and why is this element kept in the new version of the pcb ?

Tnks
Marc

8714. Re: 10.7 MHz noise filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-19 14:13:18 UTC
From: Sam
Topic: 8713 Message: 8714

The noise filter never actually had anything to do with the control board; it was just too small to justify having its own SLIM board. I actually use it in my Expanded Log Detector, which consists of VGA-->Noise Filter-->Log Detector. It filters out much of the noise created or amplified by the VGA, giving a bit more dynamic range. (Actually, I then sacrifice some of that extra range by reducing the IF2 amp gain to a level I am more comfortable with). In order to use it I cut it off the control board and gave it an "in-line" configuration.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "marcolanie" <Marc.olanie@...> wrote:
>
>
> Hi
>
> Reading the documentation of the MSA, I stumbled on this :
>
> "The SLIM-CB-NV is designed with a Noise Filter Section. The noise
> filter is not required for any MSA configuration. All the components in
> that section can be omitted."
>
> What was the historical reason of this filter ? and why is this element
> kept in the new version of the pcb ?
>
> Tnks
> Marc
>

8715. RE: [spectrumanalyzer] Re: 10.7 MHz noise filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-19 14:34:45 UTC
From: marc olanié
Topic: 8713 Message: 8715

Thks Sam.

>The noise filter never actually had anything to do with the control board;
it was just too small to justify having its own SLIM board.
That's sounds logical

> I actually use it in my Expanded Log Detector, which consists of
VGA-->Noise Filter-->Log Detector.

Lost in the alphabet soup of the MSA: What is the VGA ? (first though, it
should be an input amplifier, but except the fixed IF amp, I can see nothing
else)

>It filters out much of the noise created or amplified by the VGA, giving a
bit more dynamic range.
>(Actually, I then sacrifice some of that extra range by reducing the IF2
amp gain to a level I am more comfortable with).

Added in the "to study" list.

> In order to use it I cut it off the control board and gave it an "in-line"
configuration.
I think I'd better print another pcb... playing surgery on the command board
seems a little bit tricky to me
Tnks again Sam

Marc

8716. RE: [spectrumanalyzer] Re: 10.7 MHz noise filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-19 16:49:09 UTC
From: william sprowls
Topic: 8713 Message: 8716

Hi Marc,
 Sam has it pretty close, but I'll elaborate. Originally, this area of the Control Board was just wasted space. So, I said to myself, "hmmmm, I hate wasted space so what to put there?". I reasoned that many builders would want to build (or buy) their own Final Crystal Filter(s). Since a fairly wide Final Filter would be a good option for one of the Final Filter Paths (one of four), I put the Ceramic Filter on the Control Board as one of the Paths. As it turned out, that particular ceramic filter (a single stage) did not have very good rejection at frequencies outside of its bandwidth. However, it is good enough for VNA purposes. Hence, it was left on the latest revision of the CB.
 I am pretty sure that the next revision of the CB will not have that filter area.
Scotty

--- On Sat, 11/19/11, marc olanié <Marc.olanie@...> wrote:

From: marc olanié <Marc.olanie@...>
Subject: RE: [spectrumanalyzer] Re: 10.7 MHz noise filter
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, November 19, 2011, 8:34 AM

Thks Sam.

>The noise filter never actually had anything to do with the control board;

it was just too small to justify having its own SLIM board.

That's sounds logical

> I actually use it in my Expanded Log Detector, which consists of

VGA-->Noise Filter-->Log Detector.

Lost in the alphabet soup of the MSA: What is the VGA ? (first though, it

should be an input amplifier, but except the fixed IF amp, I can see nothing

else)

>It filters out much of the noise created or amplified by the VGA, giving a

bit more dynamic range.

>(Actually, I then sacrifice some of that extra range by reducing the IF2

amp gain to a level I am more comfortable with).

Added in the "to study" list.

> In order to use it I cut it off the control board and gave it an "in-line"

configuration.

I think I'd better print another pcb... playing surgery on the command board

seems a little bit tricky to me

Tnks again Sam

Marc

8717. RE: [spectrumanalyzer] Re: 10.7 MHz noise filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-19 17:05:45 UTC
From: marc olanié
Topic: 8713 Message: 8717

Thank you Scotty for those explanations.

In fact, I initially thought it was one of those filters, but the beginning of the “command board” chapter put me in trouble J

I already have 2 sets of filters. This will be the third one dedicated to the VNA, “just in case”. I’m pretty sure I have all the needed components in my junkbox, it won’t be a big deal if this filter will not be uses in the future.

Tnks again

Marc

De : spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] De la part de william sprowls
Envoyé : samedi 19 novembre 2011 17:49
À : spectrumanalyzer@yahoogroups.com
Objet : RE: [spectrumanalyzer] Re: 10.7 MHz noise filter

Hi Marc,
Sam has it pretty close, but I'll elaborate. Originally, this area of the Control Board was just wasted space. So, I said to myself, "hmmmm, I hate wasted space so what to put there?". I reasoned that many builders would want to build (or buy) their own Final Crystal Filter(s). Since a fairly wide Final Filter would be a good option for one of the Final Filter Paths (one of four), I put the Ceramic Filter on the Control Board as one of the Paths. As it turned out, that particular ceramic filter (a single stage) did not have very good rejection at frequencies outside of its bandwidth. However, it is good enough for VNA purposes. Hence, it was left on the latest revision of the CB.
I am pretty sure that the next revision of the CB will not have that filter area.
Scotty

--- On Sat, 11/19/11, marc olanié < <mailto:Marc.olanie@...> Marc.olanie@...> wrote:

From: marc olanié < <mailto:Marc.olanie@...> Marc.olanie@decision.fr>
Subject: RE: [spectrumanalyzer] Re: 10.7 MHz noise filter
To: <mailto:spectrumanalyzer@yahoogroups.com> spectrumanalyzer@yahoogroups.com
Date: Saturday, November 19, 2011, 8:34 AM

Thks Sam.

>The noise filter never actually had anything to do with the control board;
it was just too small to justify having its own SLIM board.
That's sounds logical

> I actually use it in my Expanded Log Detector, which consists of
VGA-->Noise Filter-->Log Detector.

Lost in the alphabet soup of the MSA: What is the VGA ? (first though, it should be an input amplifier, but except the fixed IF amp, I can see nothing else)

>It filters out much of the noise created or amplified by the VGA, giving a bit more dynamic range.
>(Actually, I then sacrifice some of that extra range by reducing the IF2 amp gain to a level I am more comfortable with).

Added in the "to study" list.

> In order to use it I cut it off the control board and gave it an "in-line" configuration.
I think I'd better print another pcb... playing surgery on the command board seems a little bit tricky to me
Tnks again Sam

Marc

8718. Re: 10.7 MHz noise filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-19 18:29:25 UTC
From: Sam
Topic: 8713 Message: 8718

I should point out that while the single-stage ceramic filter does not make a great RBW filter, cascading two ceramics with nothing between them, but using the LC impedance match on the board input and output, makes a nice RBW filter for 30 kHz and up.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, marc olaniÃ© <Marc.olanie@...> wrote:
>
> Thank you Scotty for those explanations.
>
> In fact, I initially thought it was one of those filters, but the beginning of the â□□command boardâ□□ chapter put me in trouble J
>
> I already have 2 sets of filters. This will be the third one dedicated to the VNA, â□□just in caseâ□□. Iâ□□m pretty sure I have all the needed components in my junkbox, it wonâ□□t be a big deal if this filter will not be uses in the future.
>
> Tnks again
>
>
>
> Marc
>
>
>
>
>
>
>
> De : spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] De la part de william sprowls
> EnvoyÃ© : samedi 19 novembre 2011 17:49
> Ã□ : spectrumanalyzer@yahoogroups.com
> Objet : RE: [spectrumanalyzer] Re: 10.7 MHz noise filter
>
>
>
>
>
>
>
>
>
> Hi Marc,
> Sam has it pretty close, but I'll elaborate. Originally, this area of the Control Board was just wasted space. So, I said

to myself, "hmmmm, I hate wasted space so what to put there?". I reasoned that many builders would want to build (or buy) their own Final Crystal Filter(s). Since a fairly wide Final Filter would be a good option for one of the Final Filter Paths (one of four), I put the Ceramic Filter on the Control Board as one of the Paths. As it turned out, that particular ceramic filter (a single stage) did not have very good rejection at frequencies outside of its bandwidth. However, it is good enough for VNA purposes. Hence, it was left on the latest revision of the CB.
> I am pretty sure that the next revision of the CB will not have that filter area.
> Scotty
>
> --- On Sat, 11/19/11, marc olaniÃ© < <mailto:Marc.olanie@...> Marc.olanie@...> wrote:
>
>
> From: marc olaniÃ© < <mailto:Marc.olanie@...> Marc.olanie@...>
> Subject: RE: [spectrumanalyzer] Re: 10.7 MHz noise filter
> To: <mailto:spectrumanalyzer@yahoogroups.com> spectrumanalyzer@yahoogroups.com
> Date: Saturday, November 19, 2011, 8:34 AM
>
>
>
> Thks Sam.
>
> >The noise filter never actually had anything to do with the control board;
> it was just too small to justify having its own SLIM board.
> That's sounds logical
>
> > I actually use it in my Expanded Log Detector, which consists of
> VGA-->Noise Filter-->Log Detector.
>
> Lost in the alphabet soup of the MSA: What is the VGA ? (first though, it
> should be an input amplifier, but except the fixed IF amp, I can see nothing
> else)
>
> >It filters out much of the noise created or amplified by the VGA, giving a
> bit more dynamic range.
> >(Actually, I then sacrifice some of that extra range by reducing the IF2
> amp gain to a level I am more comfortable with).
>
> Added in the "to study" list.
>
> > In order to use it I cut it off the control board and gave it an "in-line"
> configuration.
> I think I'd better print another pcb... playing surgery on the command board
> seems a little bit tricky to me
> Tnks again Sam
>
> Marc
>

8719. RE: [spectrumanalyzer] Re: 10.7 MHz noise filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-19 22:57:17 UTC
From: marc olanié
Topic: 8713 Message: 8719

>cascading two ceramics with nothing between them, but using the LC
impedance match
>on the board input and output, makes a nice RBW filter for 30 kHz and up.

I love the idea. I think I'll spend some time with my VNA this week-end :-)

73'
Marc f6itu

8720. Re: Semi rigid RG402

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-19 23:13:51 UTC
From: Len
Topic: 8707 Message: 8720

Hello. Try http://www.rfsupplier.com/ China.

For 402 .141 coax see Page link
http://www.rfsupplier.com/coaxial-cable-semi-rigid-rg402-feet-p-32.html

Note: the photo is wrong but the cable has an copper outer: $15 for 10 feet. Approx $3 per meter.

I have bought other SMA and BNC connector bits from them. They have been fine. Good English.

Regards Len Spyker

8721. Re: [spectrumanalyzer] Re: Semi rigid RG402

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-19 23:59:18 UTC
From: Bill Maxwell
Topic: 8707 Message: 8721

Thanks for that timely pointer, Len.

Bill

On 20/11/2011 10:13 AM, Len wrote:
>
>
> Hello. Try http://www.rfsupplier.com/ China.
>
> For 402 .141 coax see Page link
> http://www.rfsupplier.com/coaxial-cable-semi-rigid-rg402-feet-p-32.html
>
> Note: the photo is wrong but the cable has an copper outer: $15 for
> 10 feet. Approx $3 per meter.
>
> I have bought other SMA and BNC connector bits from them. They have
> been fine. Good English.
>
> Regards Len Spyker
>
>
>
>

8722. Re: [spectrumanalyzer] Re: Semi rigid RG402

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-19 23:59:40 UTC
From: Jurgen
Topic: 8707 Message: 8722

Thanks Len,
I tried Chinarf, that did not work out.
After that I found several cables on eBay under UT-141 and bought them.
That should last me until the end of the project.
Jurgen

On 11/19/2011 6:13 PM, Len wrote:
>
> Hello. Try http://www.rfsupplier.com/ China.
>
> For 402 .141 coax see Page link
> http://www.rfsupplier.com/coaxial-cable-semi-rigid-rg402-feet-p-32.html
>
> Note: the photo is wrong but the cable has an copper outer: $15 for
> 10 feet. Approx $3 per meter.
>
> I have bought other SMA and BNC connector bits from them. They have
> been fine. Good English.
>
> Regards Len Spyker
>
>

8723. Re: Semi rigid RG402

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-20 00:36:18 UTC
From: Sam
Topic: 8707 Message: 8723

Len,
How did you locate the page you linked to? Every time I search rfsupplier I get odd cable numbers and the price of everything shows as $0.00.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Len" <redmond2@...> wrote:
>
> Hello. Try http://www.rfsupplier.com/ China.
>
>
>
> For 402 .141 coax see Page link
> http://www.rfsupplier.com/coaxial-cable-semi-rigid-rg402-feet-p-32.html
>
> Note: the photo is wrong but the cable has an copper outer: $15 for 10
> feet. Approx $3 per meter.
>
>
>
> I have bought other SMA and BNC connector bits from them. They have been
> fine. Good English.
>
> Regards Len Spyker
>

8724. Re: Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-20 00:45:17 UTC
From: neganur
Topic: 8672 Message: 8724

I noticed sparks during my first relay test. Shouldn't there be a diode over the relay coil?

My switch is basically ready. I ran out of 4.7uF ceramic capacitors though and the only other value I have in my SMD box are 2,2uF tantalum.

Chris

--- In spectrumanalyzer@yahoogroups.com, "neganur" <neganur@...> wrote:
>
> Hi!
>
> I started populating the input switch and noticed that the PCB file doesn't match the schematic version (the PCB file version is two days older).
>
> Additionally, R6 in the schematic is R5 on the PCB (1/4 W 100 Ohm). There is no R6 on the PCB.
>
> The quality of the board is fantastic by the way, I was expecting the tinned solder mask-less PCB-Express style.
>
> Chris
>

8725. Re: Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-20 13:51:29 UTC
From: Sam
Topic: 8672 Message: 8725

Chris,
I was hoping that the capacitors would handle that by slowing the turn-off, but I wasn't sure since I have no idea what the inductance of the coil is. Sounds like a diode might be a good idea.

2.2 uF caps are fine. This only needs to operate down to 100 kHz or so, and 2.2 uF will have fairly low impedance at that frequency.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "neganur" <neganur@...> wrote:
>
> I noticed sparks during my first relay test. Shouldn't there be a diode over the relay coil?
>
> My switch is basically ready. I ran out of 4.7uF ceramic capacitors though and the only other value I have in my SMD box are 2,2uF tantalum.
>
> Chris
>
> --- In spectrumanalyzer@yahoogroups.com, "neganur" <neganur@> wrote:
> >
> > Hi!
> >
> > I started populating the input switch and noticed that the PCB file doesn't match the schematic version (the PCB file version is two days older).
> >
> > Additionally, R6 in the schematic is R5 on the PCB (1/4 W 100 Ohm). There is no R6 on the PCB.
> >
> > The quality of the board is fantastic by the way, I was expecting the tinned solder mask-less PCB-Express style.
> >
> > Chris
> >
>

8726. Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-20 16:46:28 UTC
From: Sam
Topic: 8672 Message: 8726

I have largely completed the Input Switch. I tested the isolation with the necessary lids in place. A photo of the result is here:
<http://groups.yahoo.com/group/spectrumanalyzer/photos/album/252922278/pic/1534612461/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>

My goal was 90 dB isolation from 100 kHz to 1 GHz. I exceeded that everywhere except the bottom couple of kHz. Once above 300 kHz, the isolation exceeded 100 dB, except noise would occasionally make the graph spike above that level.

Sam W.

8727. Re: Semi rigid RG402

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-20 20:45:09 UTC
From: Rex Pearson
Topic: 8707 Message: 8727

Try this link via their ebay store

http://stores.ebay.com/rfsupplier/RF-Coaxial-Cable-/_i.html?_fsub=21064307
<http://stores.ebay.com/rfsupplier/RF-Coaxial-Cable-/_i.html?_fsub=21064307&
_sid=174265176&_trksid=p4634.c0.m322> &_sid=174265176&_trksid=p4634.c0.m322

Have also bought connectors, semi and flexible cable from them - great
service and product seems quite good

Rex

8728. Re: Semi rigid RG402

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-20 23:24:59 UTC
From: Len
Topic: 8707 Message: 8728

Hello Sam and Group

Yes, the <http://www.rfsupplier.com/> http://www.rfsupplier.com/ web site is a bit disorganized.

But I wrote an e-mail to their Contact person who was very helpful and pointed me to the pages for the bits I wanted.

The page with $0 appears to be for bulk cable reels ??

Regards

Len

8729. Re: Semi rigid RG402

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-21 02:26:00 UTC
From: voltspermetre
Topic: 8707 Message: 8729

I have also dealt with these guys. They are eager to do business with anyone, and generally stock high quality Chinese RF products made to the same specifications as western goods. Just one word about contacting them. Their Chinese contact's English is pretty good, but unless you are careful what you write, there may be difficulties. Don't be ashamed to keep your sentences very basic, short, and to the point. I have found with my Uni students from China that this simple idea greatly maximises their understanding.
Slang, or lots of subordinate clauses will cause them serious problems, because the overall structure of Chinese languages is totally different from English!

David, VK6JT

8730. Input Switch

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-22 00:49:20 UTC
From: Sam
Topic: 8672 Message: 8730

I pose the following intellectual or experimental challenge relating to the Input Switch, which most likely applies to the Forward/Reverse switch (using the PE4251) as well.

The isolation of the switch is excellent from 1 MHz to 1 GHz. I haven't tested this exact switch at higher frequencies, but based on prototypes the isolation will decline, as one would expect, at higher frequencies.

The odd thing is that isolation apparently declines below 1 MHz. If you simply do a Transmission scan with the TG as input, it appears that leakage (crosstalk, if you prefer) increases as the frequency declines below 1 MHz, reaching about -80 dBm at 100 kHz. But I believe this actually has to do with some very high frequency components of the TG, and there is actually virtually no low frequency leakage. Consider these facts:

1. When tested at various phases of construction, the level of leakage was extremely sensitive to the amount of shielding. Normally, leakage at, say, 100 kHz, would not be "through the air", but would have to do with insufficient capacitor bypassing or some such thing.

2. If the TG is passed through a coaxial tee, with the third arm shorted, there should be virtually no 100 kHz signal surviving the tee. Yet the amount of apparent "leakage" remains constant.

3. If an external 100 kHz signal source is used, no leakage is apparent.

Here is the theory I pulled from my a**: There is some very high frequency leakage of signals with some low level AM or PM, which are somehow demodulated in the switches to create the apparent low frequency leakage. As an example, I know that op amps sometimes have the effect of demodulating signals beyond their frequency range.

One further experimental fact: using a MiniCircuits 700 MHz low pass filter on the TG has absolutely no effect once the board is properly shielded, but did have some effect before full shielding. I think this indicates that the frequencies of interest are too high for the filter to deal with. Consider that the filter is probably intended to be used on a thinner PCB than we use, and the grounding vias on a thinner board will be more effective.

If someone could figure out the cause, that would be appreciated. If someone could experimentally eliminate this effect, that would be even better.

Sam Wetterlin

8731. VHF Trans/Reflect Set

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-22 13:58:13 UTC
From: Sam
Topic: 8731 Message: 8731

Hi All,
A board labeled VHF Trans/Reflect Set was included in one of the PCB group buys. I have discovered two errors. First, there is provision on the board for ESD diode D1 on the T/R input, but that diode is missing from the schematic. ESD5V0D3 would work. Also, D2, the relay protection diode, is not properly placed on the schematic or board. It should be across the relay coil (pointing to + terminal), or pointing from the - coil terminal to the +10 supply.

I know of one person currently building this board. If anyone else has built it, let me know how it worked out.

Sam W.

8732. Max. input level rbw filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-24 12:09:58 UTC
From: sfcillari
Topic: 8732 Message: 8732

I just finished my rbw filter switch (which works perfect btw) and started to calibrate each path. When I got to the amplifilter (opa695) I hit a wall. To diagnose I connected a SG at the input of the filter and from +7db and up there was no increase at the output. So max. input level is about 7.5db. I then measured my IF amp output and it puts out +12.5db with -6db at the input of the msa. I believe that's about right. Is there a max. what the filter can handle? And what can I do to extend the range a bit?

Simon

8734. Re: Max. input level rbw filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-24 14:23:20 UTC
From: Sam
Topic: 8732 Message: 8734

The op amp must be saturating. The MSA input level that causes saturation depends on losses in the mixers and cavity filter, and the gain of the IF2 amp.

Assuming you are using the 8V regulator, the simplest way to increase the upper end is to reduce the gain of the op amp. Sounds like you need to cut it in half (R5=560). This won't increase total range, because you will lose an equal amount of the low end. But you should probably adjust the op amp gain so the upper end of the amplifilter path approximately matches that of other paths, just for convenience.

As far as the max allowable power, the crystals in the amplifilter are probably no different from those in any other filter. For my taste, +12 dBm is too much power, but the range of the MSA depends in part on high IF2 amp gain, which means a lot of power through the filters at high input levels. That was part of my motivation with using the Expanded Log Detector, because it allowed me to get good range while decreasing the IF2 amp gain by about 10 dB. On the other hand, I haven't heard of anyone damaging a filter with the full IF2 amp gain.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "sfcillari" <sf-cillari@...> wrote:
>
> I just finished my rbw filter switch (which works perfect btw) and started to calibrate each path. When I got to the amplifilter (opa695) I hit a wall. To diagnose I connected a SG at the input of the filter and from +7db and up there was no increase at the output. So max. input level is about 7.5db. I then measured my IF amp output and it puts out +12.5db with -6db at the input of the msa. I believe that's about right. Is there a max. what the filter can handle? And what can I do to extend the range a bit?
>
> Simon
>

8735. Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-24 21:21:59 UTC
From: Jurgen
Topic: 8735 Message: 8735

My MSA is almost complete. Started testing.
Looking at spur's I found the following:

8.0264 MHz -73 dBm
9.3576 MHz -100 dBm
10.7 MHz -102 dBM
12.038 MHz -68 dBm
16.05 MHz -98 dBm
21.4 MHz -102 dBm

There may be more, but I was concentrating on peaks above -105 dBm.

All modules are fenced and properly mounted.
PLO's, Mixer's, Comp amp, IF amp, filter, VGA, are sealed.

Oscillator, phase detector, A/D converter fenced but still open.
All RF connections use UT141, solid copper tubing.
10.7 MHz section of DDS sealed, rest open.

I manually sealed the above modules with no effect.

How does this result compare to the rest of you.

Thanks, Jurgen

8736. SLIM PDM with Rev 0 pwb

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-24 22:59:54 UTC
From: Steve
Topic: 8736 Message: 8736

Scotty,

The phase detector module I constructed a couple of years ago uses a Rev 0 PWB and does not have the improvements for phase resolution or one-shot stability that were developed later.

I have another phase detector Rev 0 PWB with which I'd like to construct a second phase detector module with the improved operation -- I think that would make it a REV C SLIM. After I get the second one working, I plan to modify the first one for the same improvements.

Sadly, I have lost the printed copies I had of the parts list, schematic and text description related to the Rev 0 PWB. Seems to me I need those as a starting point. Are those documents still available? If they are out there on the web site, perhaps you could point me to them?

Thanks.

Steve K8JQ

--
Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

8737. Re: Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-24 23:05:03 UTC
From: Sam
Topic: 8735 Message: 8737

You have a smaller number of spurs than I do, but a couple of big ones. Your 12.038 MHz (8*LO1-8*LO2, I think) spur probably results from LO1 leaking through Mixer 1 and the cavity filter to Mixer 2, and mixing with LO2. Maybe you have high leakage of LO1 through Mixer 1. If you have a way to check the Mixer 1 output for LO2 content, it would be worth doing.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> My MSA is almost complete. Started testing.
> Looking at spur's I found the following:
>
> 8.0264 MHz -73 dBm
> 9.3576 MHz -100 dBm
> 10.7 MHz -102 dBM
> 12.038 MHz -68 dBm
> 16.05 MHz -98 dBm
> 21.4 MHz -102 dBm
>
> There may be more, but I was concentrating on peaks above -105 dBm.
>
> All modules are fenced and properly mounted.
> PLO's, Mixer's, Comp amp, IF amp, filter, VGA, are sealed.
>
> Oscillator, phase detector, A/D converter fenced but still open.
> All RF connections use UT141, solid copper tubing.
> 10.7 MHz section of DDS sealed, rest open.
>
> I manually sealed the above modules with no effect.
>
> How does this result compare to the rest of you.
>
> Thanks, Jurgen
>

8738. Re: [spectrumanalyzer] Re: Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-25 09:46:49 UTC
From: Jurgen
Topic: 8735 Message: 8738

Thanks Sam,
That would mean Mixer 1 would be imbalanced? That would require an other SA which I don't have.
I wonder if the FFT from my scope would tell me anything. The levels are low, the internal scope noise would get into the way.
Jurgen

On 11/24/2011 6:05 PM, Sam wrote:
>
> You have a smaller number of spurs than I do, but a couple of big
> ones. Your 12.038 MHz (8*LO1-8*LO2, I think) spur probably results
> from LO1 leaking through Mixer 1 and the cavity filter to Mixer 2, and
> mixing with LO2. Maybe you have high leakage of LO1 through Mixer 1.
> If you have a way to check the Mixer 1 output for LO2 content, it
> would be worth doing.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@...> wrote:
> >
> > My MSA is almost complete. Started testing.
> > Looking at spur's I found the following:
> >
> > 8.0264 MHz -73 dBm
> > 9.3576 MHz -100 dBm
> > 10.7 MHz -102 dBM
> > 12.038 MHz -68 dBm
> > 16.05 MHz -98 dBm
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> > There may be more, but I was concentrating on peaks above -105 dBm.
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> > Oscillator, phase detector, A/D converter fenced but still open.
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> > 10.7 MHz section of DDS sealed, rest open.
> >
> > I manually sealed the above modules with no effect.
> >
> > How does this result compare to the rest of you.
> >
> > Thanks, Jurgen
> >

>
>

8739. Re: [spectrumanalyzer] SLIM PDM with Rev 0 pwb

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-25 15:12:39 UTC
From: william sprowls
Topic: 8736 Message: 8739

Hi Steve,
 I updated the PDM web page:
http://scottyspectrumanalyzer.com/slim_PDM.html
It now links the archived documents for what you need. Be sure to do a "refresh" in your browser to get the latest page.
Scotty

--- On Thu, 11/24/11, Steve <steve65@...> wrote:

From: Steve <steve65@...>
Subject: [spectrumanalyzer] SLIM PDM with Rev 0 pwb
To: spectrumanalyzer@yahoogroups.com
Date: Thursday, November 24, 2011, 4:59 PM

Scotty,

The phase detector module I constructed a couple of years ago uses a Rev

0 PWB and does not have the improvements for phase resolution or

one-shot stability that were developed later.

I have another phase detector Rev 0 PWB with which I'd like to construct

a second phase detector module with the improved operation -- I think

that would make it a REV C SLIM. After I get the second one working, I

plan to modify the first one for the same improvements.

Sadly, I have lost the printed copies I had of the parts list, schematic

and text description related to the Rev 0 PWB. Seems to me I need those

as a starting point. Are those documents still available? If they are

out there on the web site, perhaps you could point me to them?

Thanks.

Steve K8JQ

--

Read The Patriot Post Vertitas vos Liberabit

http://patriotpost.us/subscription/

8740. Re: Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-25 15:36:20 UTC
From: Sam
Topic: 8735 Message: 8740

Jurgen,
If I have the mechanism right, the leakage through Mixer 1 would actually be pretty strong. LO1 would be 12.038 MHz above the cavity filter center, so it should be attenuated quite a bit before it gets to Mixer 2, and the level out of Mixer 1 could be -10 dBm or even higher.

Maybe the simplest thing would be to replace Mixer 1. Or maybe as a first step put an attenuator in the line from Mixer 1 to the cavity filter, to see what that does to your spurs. My guess it that this will reduce spurs for which (10.7 MHz-spur frequency) equals (10.7 MHz/N) for some small +/- integer N.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> Thanks Sam,
> That would mean Mixer 1 would be imbalanced? That would require an other
> SA which I don't have.
> I wonder if the FFT from my scope would tell me anything. The levels are
> low, the internal scope noise would get into the way.
> Jurgen
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>
> On 11/24/2011 6:05 PM, Sam wrote:
> >
> > You have a smaller number of spurs than I do, but a couple of big
> > ones. Your 12.038 MHz (8*LO1-8*LO2, I think) spur probably results
> > from LO1 leaking through Mixer 1 and the cavity filter to Mixer 2, and
> > mixing with LO2. Maybe you have high leakage of LO1 through Mixer 1.
> > If you have a way to check the Mixer 1 output for LO2 content, it
> > would be worth doing.
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@> wrote:
> > >
> > > My MSA is almost complete. Started testing.
> > > Looking at spur's I found the following:
> > >
> > > 8.0264 MHz -73 dBm
> > > 9.3576 MHz -100 dBm
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> > > 12.038 MHz -68 dBm
> > > 16.05 MHz -98 dBm
> > > 21.4 MHz -102 dBm
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> > > There may be more, but I was concentrating on peaks above -105 dBm.
> > >
> > > All modules are fenced and properly mounted.
> > > PLO's, Mixer's, Comp amp, IF amp, filter, VGA, are sealed.
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> > > Oscillator, phase detector, A/D converter fenced but still open.
> > > All RF connections use UT141, solid copper tubing.
> > > 10.7 MHz section of DDS sealed, rest open.
> > >
> > > I manually sealed the above modules with no effect.
> > >
> > > How does this result compare to the rest of you.
> > >
> > > Thanks, Jurgen
> > >
> >
> >
>

8741. Crystal filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-25 17:19:14 UTC
From: Jurgen
Topic: 5999 Message: 8741

Is anyone familiar with the 10P7d NDK filter?

Thanks, Jurgen
//

8742. Re: [spectrumanalyzer] Crystal filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-25 18:25:19 UTC
From: Neganur
Topic: 5999 Message: 8742

I scanned a new set of S1P data sets for that filter today, I'll combine them and upload once I'm home.

Sent from my iPod

On 25 Nov 2011, at 19:19, Jurgen <khj221@...> wrote:

> Is anyone familiar with the 10P7d NDK filter?
>
> Thanks, Jurgen
>
>

8743. Re: [spectrumanalyzer] Re: Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-25 18:57:48 UTC
From: william sprowls
Topic: 8735 Message: 8743

Hi Jurgen and All,
Spurs within the MSA (and any spectrum analyzer) are mathematically predictable. For the MSA, any time a combination of signals create 10.7 MHz (final I.F.) or 1013.3 MHz (1st I.F.) a potential spur will exist. Whether or not the spurs become problematic (visible on the graph) depends on the original design and the implementation of that design (filtering). The number of predictable spurs are related to the number of signals and the number of local oscillators and mixers. This is why my original design of the Spectrum Analyzer uses a dual conversion, rather than more multiple conversions like the Big Boys use. They create more spurs, then spend a lot of money on extra filtering to get rid of those spurs. (dumb)

The Verification MSA (in SA Mode) does not display any of your spurs except the one at 10.7 MHz (displayed as -112 dBm). They may be created in the MSA but they are below the noise floor at -120 dBm.

Sam guessed that the spur at 12.038 MHz is a product of the two PLO's (8*LO1-8*LO2). He is right on.

Here are the mathematics for known spurs.
(m*LO1 - n*LO2 = 10.7 MHz) or
(n*LO2 - m*LO1 = 10.7 MHz), where m and n are any whole numbers.
These formulas "assume" that the Master oscillator is "right on" at 64 MHz and the Final IF Filter is exactly 10.7 MHz. This dictates that LO1 will always be exactly 1013.3 MHz above the Commanded Frequency (where the spur shows up).

Here are some calculated known potential spurs:
Spur at 8.025 MHz: 4*LO2 - 4*LO1=10.7 MHz = 4*1024 - (4*1021.325) = 10.7
Spur at 9.3625 MHz: 8*LO2 - 8*LO1=10.7 MHz = 8*1024 - (8*1022.6625) = 10.7
Spur at 10.7 MHz : DDS 1 spurious (see below)
Spur at 12.0375 MHz : 8*LO1 - 8*LO2
Spur at 16.05 MHz : 2*LO1 - 2*LO2
Spur at 21.4 MHz : 1*LO1 - 1*LO2 (this is the image frequency that the cavity filter is designed to eliminate)
As you can see, these spurs are the ones you have, but are a tiny bit different in frequency. This is due to the fact that your Final Filter center is not exactly 10.700 MHz.

A little more on the DDS 1 spur at 10.7. If you expand your scale at this spur, you will probably find that the actual center frequency of the spur is the same frequency where DDS 1 is commanded to. Verify this by opening the Variables window and note the "dds1output = xx". Another method to verify that this spur is actually the DDS 1 frequency, halt the sweep, open the Sweep Parameters Window and click the Spur Test button. Continue the sweep and notice the spur has moved. The Spur Test changes the PLO 1 phase detector frequency, which changes the DDS 1 frequency.
The DDS 1 spur is created by the DDS 1 modulating the PLO 1 and creating sidebands. You can also see this spur by commanding the MSA Center Frequency to -10.7 MHz. Yes, this is allowed, although there is no such thing as a negative frequency. However, this commands

the PLO 1 to 1002.6 MHz. DDS 1 (10.7) creates an upper sideband (although small) at (1002.6 MHz + 10.7 MHz) = 1013.3 MHz. This sideband zips right through the Cavity Filter and mixes with PLO 2 in mixer 2, creating a signal at 10.7 MHz. Bingo, the spur.

Any time you see a spur in the MSA, expand the sweep to measure the 3 dB points of the spur. If the spur BW is less than the BW of your Final Resolution Filter, then you are dealing with a harmonic. For example, your Final Filter BW is 7 KHz. Your spur shows a BW to be 1.4 KHz. This is one fifth. So you are dealing with a 5th harmonic.
Scotty

--- On Thu, 11/24/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: Spurs
To: spectrumanalyzer@yahoogroups.com
Date: Thursday, November 24, 2011, 5:05 PM

You have a smaller number of spurs than I do, but a couple of big ones. Your 12.038 MHz (8*LO1-8*LO2, I think) spur probably results from LO1 leaking through Mixer 1 and the cavity filter to Mixer 2, and mixing with LO2. Maybe you have high leakage of LO1 through Mixer 1. If you have a way to check the Mixer 1 output for LO2 content, it would be worth doing.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:

>

> My MSA is almost complete. Started testing.

> Looking at spur's I found the following:

>

> 8.0264 MHz -73 dBm

> 9.3576 MHz -100 dBm

> 10.7 MHz -102 dBM

> 12.038 MHz -68 dBm

> 16.05 MHz -98 dBm

> 21.4 MHz -102 dBm

>

> There may be more, but I was concentrating on peaks above -105 dBm.

>

> All modules are fenced and properly mounted.

> PLO's, Mixer's, Comp amp, IF amp, filter, VGA, are sealed.

>

> Oscillator, phase detector, A/D converter fenced but still open.

> All RF connections use UT141, solid copper tubing.

> 10.7 MHz section of DDS sealed, rest open.

>

> I manually sealed the above modules with no effect.

>

> How does this result compare to the rest of you.

>

> Thanks, Jurgen

>

8744. Re: Crystal filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-25 19:06:31 UTC
From: neganur
Topic: 5999 Message: 8744

OK I managed to combine the touchstone 4-port file for the NDK 10P7D and you can find it in the files section.

http://groups.yahoo.com/group/spectrumanalyzer/files/Crystal%20Filters%20RBW/NDK%2010P7D/

I will try to replace the old data of the other filters as time permits. Sam pointed out that I had not properly set the frequency resolution the network analyser I used to record the files. As a result, I had 1600 points worth of data but only with a kHz resolution and therefore quantisation errors. The new data has a resolution of 1 Hz and should be just fine.

There's both data for a matched filter (0.4 dB ripple) and the filter plain, with nothing but coax connected to take the measurements.

EDIT:

I just uploaded the file and looked at its contents. There are still some frequency duplicates. The RF network analyser I used is an HP 8714ET. It's supposed to provide touchstone data but no frequency should appear twice according to Sam. I believe you can still use the file to find a match with the SMA software, but importing it into RFSim99 may crash the programme.

Hope this helps

Chris
--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> Is anyone familiar with the 10P7d NDK filter?
>
> Thanks, Jurgen
> *//*
>

8745. Re: [spectrumanalyzer] Re: Crystal filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-25 19:18:48 UTC
From: Christian Cziezerski
Topic: 5999 Message: 8745

false alarm :)

the files are fine and I need some coffee!

8746. Re: Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-25 20:27:19 UTC
From: Sam
Topic: 8735 Message: 8746

It appears that the common element in all of Jurgen's spurs, except that at 10.7 MHz, is that they depend on LO1 (or certain harmonics) passing through Mixer 1 and the cavity filter. If it is actually LO1 leakage, I would have expected the spurs to be stronger where LO1 is closest to 1013.3 MHz, meaning LO1 would pass most easily through the cavity filter. But that is not the case, making me suspect that what is really leaking is the second and/or fourth harmonic of LO1. The fourth harmonic in particular might have an easy time passing through the cavity filter, and would explain why the strongest spurs involve multiples of 4 and 8.

Perhaps a simple low pass filter at the cavity filter input or output would solve the problem. Like the Minicircuits LFCN-1000.

It is also possible that the amount of leakage through Mixer 1 is sensitive to the LO level. Jurgen, if your LO1 is very strong, you might consider reducing it 3 dB to see what happens.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Jurgen and All,
> Â Spurs within the MSA (and any spectrum analyzer) are mathematically predictable. For the MSA, any time a combination of signals create 10.7 MHz (final I.F.) or 1013.3 MHz (1st I.F.) a potential spur will exist. Whether or not the spurs become problematic (visible on the graph) depends on the original design and the implementation of that design (filtering).Â The number of predictable spurs are related to the number of signals and the number of local oscillators and mixers. This is why my original design of the Spectrum Analyzer uses a dual conversion, rather than more multiple conversions like the Big Boys use. They create more spurs, then spend a lot of money on extra filtering to get rid of those spurs. (dumb)
>
> Â The Verification MSA (in SA Mode) does not display any of your spurs except the one at 10.7 MHz (displayed as -112 dBm). They may be created in the MSA but they are below the noise floor at -120 dBm.
>
> Â Sam guessed that the spur at 12.038 MHz is a product of the two PLO's (8*LO1-8*LO2). He is right on.
>
> Â Here are the mathematics for known spurs.
> Â (m*LO1 - n*LO2 = 10.7 MHz) or
> (n*LO2 - m*LO1 = 10.7 MHz), where m and n are any whole numbers.
> Â These formulas "assume" that the Master oscillator is "right on" at 64 MHz and the Final IF Filter is exactly 10.7 MHz. This dictates that LO1 will always be exactly 1013.3 MHz above the Commanded Frequency (where the spur shows up).
>
> Here are some calculated known potential spurs:

> Spur at 8.025 MHz: 4*LO2 - 4*LO1=10.7 MHz = 4*1024 - (4*1021.325) = 10.7
> Spur at 9.3625 MHz: 8*LO2 - 8*LO1=10.7 MHz = 8*1024 - (8*1022.6625) = 10.7
> Spur at 10.7 MHz : DDS 1 spurious (see below)
> Spur at 12.0375 MHz : 8*LO1 - 8*LO2
> Spur at 16.05 MHz : 2*LO1 - 2*LO2
> Spur at 21.4 MHz : 1*LO1 - 1*LO2 (this is the image frequency that the cavity filter is designed to eliminate)
> Â As you can see, these spurs are the ones you have, but are a tiny bit different in frequency. This is due to the fact that your Final Filter center is not exactly 10.700 MHz.
>
> Â A little more on the DDS 1 spur at 10.7. If you expand your scale at this spur, you will probably find that the actual center frequency of the spur is the same frequency where DDS 1 is commanded to. Verify this by opening the Variables window and note the "dds1output = xx". Another method to verify that this spur is actually the DDS 1 frequency, halt the sweep, open the Sweep Parameters Window and click the Spur Test button. Continue the sweep and notice the spur has moved. The Spur Test changes the PLO 1 phase detector frequency, which changes the DDS 1 frequency.
> Â The DDS 1 spur is created by the DDS 1 modulating the PLO 1 and creating sidebands. You can also see this spur by commanding the MSA Center Frequency to -10.7 MHz. Yes, this is allowed, although there is no such thing as a negative frequency. However, this commands the PLO 1 to 1002.6 MHz. DDS 1 (10.7) creates an upper sideband (although small) at (1002.6 MHz + 10.7 MHz) = 1013.3 MHz. This sideband zips right through the Cavity Filter and mixes with PLO 2 in mixer 2, creating a signal at 10.7 MHz. Bingo, the spur.
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> Â Any time you see a spur in the MSA, expand the sweep to measure the 3 dB points of the spur. If the spur BW is less than the BW of your Final Resolution Filter, then you are dealing with a harmonic. For example, your Final Filter BW is 7 KHz. Your spur shows a BW to be 1.4 KHz. This is one fifth. So you are dealing with a 5th harmonic.
> Scotty
>
> --- On Thu, 11/24/11, Sam <swetterlin@...> wrote:
>
> From: Sam <swetterlin@...>
> Subject: [spectrumanalyzer] Re: Spurs
> To: spectrumanalyzer@yahoogroups.com
> Date: Thursday, November 24, 2011, 5:05 PM
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> Sam W.
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>
>
> --- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@> wrote:
>
> >
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> > My MSA is almost complete. Started testing.
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> > Looking at spur's I found the following:
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> > 8.0264 MHz -73 dBm
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> > I manually sealed the above modules with no effect.
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>
> > How does this result compare to the rest of you.
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> >
>
> > Thanks, Jurgen
>
> >
>

8747. Re: Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-25 20:45:34 UTC
From: Sam
Topic: 8735 Message: 8747

Jurgen,
If you want to try the filter approach, the Minicircuits VLFX-825 SMA filter would be a simple and reliable way to go, though it would cost you $40. It would completely zap all LO1 harmonics to and beyond 20 GHz. Of course, if leakage of the LO1 fundamental is the problem (which I suspect it isn't), this won't help.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> It appears that the common element in all of Jurgen's spurs, except that at 10.7 MHz, is that they depend on LO1 (or certain harmonics) passing through Mixer 1 and the cavity filter. If it is actually LO1 leakage, I would have expected the spurs to be stronger where LO1 is closest to 1013.3 MHz, meaning LO1 would pass most easily through the cavity filter. But that is not the case, making me suspect that what is really leaking is the second and/or fourth harmonic of LO1. The fourth harmonic in particular might have an easy time passing through the cavity filter, and would explain why the strongest spurs involve multiples of 4 and 8.
>
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> > Spur at 8.025 MHz: 4*LO2 - 4*LO1=10.7 MHz = 4*1024 - (4*1021.325) = 10.7
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> > Spur at 10.7 MHz : DDS 1 spurious (see below)
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> > From: Sam <swetterlin@>
> > Subject: [spectrumanalyzer] Re: Spurs
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Thursday, November 24, 2011, 5:05 PM
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8748. Re: [spectrumanalyzer] Re: Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-25 20:48:48 UTC
From: Jurgen
Topic: 8735 Message: 8748

I do remember running an FFT using my scope on the PLO1 and PLO2
outputs. They had a large amount of second and third harmonic content.
I remember mentioning this in a post. They seem to have been within the
manufacturers specifications.
Need to repeat the measurements.
I will put an attenuator in series with the cavity filter output and see
if that validates the assumptions.

Thanks for all your responses, Jurgen

On 11/25/2011 3:27 PM, Sam wrote:
>
> It appears that the common element in all of Jurgen's spurs, except
> that at 10.7 MHz, is that they depend on LO1 (or certain harmonics)
> passing through Mixer 1 and the cavity filter. If it is actually LO1
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> is really leaking is the second and/or fourth harmonic of LO1. The
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8749. Re: [spectrumanalyzer] Re: Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-25 21:03:27 UTC
From: Jurgen
Topic: 8735 Message: 8749

Sam,
I am a bit lost, we want the cavity filter to pass 1013.3 MHz.
The VLFX-825 is a 825 MHz low pass filter and will attenuate 1013.3 MHz.
What am I missing?
Jurgen

On 11/25/2011 3:45 PM, Sam wrote:
>
> Jurgen,
> If you want to try the filter approach, the Minicircuits VLFX-825 SMA
> filter would be a simple and reliable way to go, though it would cost
> you $40. It would completely zap all LO1 harmonics to and beyond 20
> GHz. Of course, if leakage of the LO1 fundamental is the problem
> (which I suspect it isn't), this won't help.
> Sam W.
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> --- In spectrumanalyzer@yahoogroups.com
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8750. Re: [spectrumanalyzer] Re: Crystal filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-25 21:29:03 UTC
From: Jurgen
Topic: 5999 Message: 8750

Thanks Chris,

Very low ripple, nice.
What do the skirts look like down to about -100 dBm.
I am looking for a filter with clean skirts to as low as possible level.

Jurgen

On 11/25/2011 2:06 PM, neganur wrote:
>
> OK I managed to combine the touchstone 4-port file for the NDK 10P7D
> and you can find it in the files section.
>
>
http://groups.yahoo.com/group/spectrumanalyzer/files/Crystal%20Filters%20RBW/NDK%2010P7D/
>
> I will try to replace the old data of the other filters as time
> permits. Sam pointed out that I had not properly set the frequency
> resolution the network analyser I used to record the files. As a
> result, I had 1600 points worth of data but only with a kHz resolution
> and therefore quantisation errors. The new data has a resolution of 1
> Hz and should be just fine.
>
> There's both data for a matched filter (0.4 dB ripple) and the filter
> plain, with nothing but coax connected to take the measurements.
>
> EDIT:
>
> I just uploaded the file and looked at its contents. There are still
> some frequency duplicates. The RF network analyser I used is an HP
> 8714ET. It's supposed to provide touchstone data but no frequency
> should appear twice according to Sam. I believe you can still use the
> file to find a match with the SMA software, but importing it into
> RFSim99 may crash the programme.
>
> Hope this helps
>
> Chris
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@...> wrote:
> >
> > Is anyone familiar with the 10P7d NDK filter?
> >
> > Thanks, Jurgen
> > *//*
> >

>
>

8751. Re: [spectrumanalyzer] Re: Crystal filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-25 22:13:04 UTC
From: Christian Cziezerski
Topic: 5999 Message: 8751
Attachments: 1 described; binary payloads are missing from this source WARC

I don't remember if I have any better pictures but I hope this one (the attachment) will do.

I use a home-brew PCB without proper plated through holes etc and the shield/fence is double-sided FR4 and copper tape. Pretty sure a proper board could improve the noise floor but this is the best filter my prototype has.

Chris

8752. Re: [spectrumanalyzer] Re: Crystal filters [1 Attachment]

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-26 00:36:33 UTC
From: Jurgen
Topic: 5999 Message: 8752

If I am correct it looks like the somewhere greater than 90 db.
There is the beginning of a lobe on the right hand side.

There are 3 filters 10P17D for sale on ebay.
I wonder what the difference is between the two, yours is a 10P7D.
I could not find any data sheets.
Jurgen

On 11/25/2011 5:13 PM, Christian Cziezerski wrote:
> [Attachment(s) <#TopText> from Christian Cziezerski included below]
>
> I don't remember if I have any better pictures but I hope this one
> (the attachment) will do.
>
>
> I use a home-brew PCB without proper plated through holes etc and
> the shield/fence is double-sided FR4 and copper tape. Pretty sure a
> proper board could improve the noise floor but this is the best filter
> my prototype has.
>
> Chris
>

8753. Re: [spectrumanalyzer] Re: Crystal filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-26 00:57:22 UTC
From: Neganur
Topic: 5999 Message: 8753

the difference is the bandwidth. The NDK10P17D has a bandwidth of 17 kHz.

Chris

On 26 Nov 2011, at 02:36, Jurgen <khj221@...> wrote:

> If I am correct it looks like the somewhere greater than 90 db.
> There is the beginning of a lobe on the right hand side.
>
> There are 3 filters 10P17D for sale on ebay.
> I wonder what the difference is between the two, yours is a 10P7D.
> I could not find any data sheets.
> Jurgen
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> On 11/25/2011 5:13 PM, Christian Cziezerski wrote:
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>> I don't remember if I have any better pictures but I hope this one (the attachment) will do.
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>> Chris
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>

8754. Re: Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-26 01:56:03 UTC
From: Sam
Topic: 8735 Message: 8754

The VLFX-825 will only attenuate slightly over 1 dB at 1013.3 MHz. Minicircuits doesn't name their filters using the 3 dB corner frequency.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> Sam,
> I am a bit lost, we want the cavity filter to pass 1013.3 MHz.
> The VLFX-825 is a 825 MHz low pass filter and will attenuate 1013.3 MHz.
> What am I missing?
> Jurgen
>
>
> On 11/25/2011 3:45 PM, Sam wrote:
> >
> > Jurgen,
> > If you want to try the filter approach, the Minicircuits VLFX-825 SMA
> > filter would be a simple and reliable way to go, though it would cost
> > you $40. It would completely zap all LO1 harmonics to and beyond 20
> > GHz. Of course, if leakage of the LO1 fundamental is the problem
> > (which I suspect it isn't), this won't help.
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
> > >
> > > It appears that the common element in all of Jurgen's spurs, except
> > that at 10.7 MHz, is that they depend on LO1 (or certain harmonics)
> > passing through Mixer 1 and the cavity filter. If it is actually LO1
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> > closest to 1013.3 MHz, meaning LO1 would pass most easily through the
> > cavity filter. But that is not the case, making me suspect that what
> > is really leaking is the second and/or fourth harmonic of LO1. The
> > fourth harmonic in particular might have an easy time passing through
> > the cavity filter, and would explain why the strongest spurs involve
> > multiples of 4 and 8.
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> > > Perhaps a simple low pass filter at the cavity filter input or
> > output would solve the problem. Like the Minicircuits LFCN-1000.
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> > > It is also possible that the amount of leakage through Mixer 1 is
> > sensitive to the LO level. Jurgen, if your LO1 is very strong, you
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> > <mailto:spectrumanalyzer%40yahoogroups.com>, william sprowls
> > <wsprowls@> wrote:
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> > > > Hi Jurgen and All,
> > > > Â Spurs within the MSA (and any spectrum analyzer) are
> > mathematically predictable. For the MSA, any time a combination of
> > signals create 10.7 MHz (final I.F.) or 1013.3 MHz (1st I.F.) a
> > potential spur will exist. Whether or not the spurs become problematic
> > (visible on the graph) depends on the original design and the
> > implementation of that design (filtering).Â The number of predictable
> > spurs are related to the number of signals and the number of local
> > oscillators and mixers. This is why my original design of the Spectrum
> > Analyzer uses a dual conversion, rather than more multiple conversions
> > like the Big Boys use. They create more spurs, then spend a lot of
> > money on extra filtering to get rid of those spurs. (dumb)
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> > > > Â The Verification MSA (in SA Mode) does not display any of your
> > spurs except the one at 10.7 MHz (displayed as -112 dBm). They may be
> > created in the MSA but they are below the noise floor at -120 dBm.
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> > > > Â Here are the mathematics for known spurs.
> > > > Â (m*LO1 - n*LO2 = 10.7 MHz) or
> > > > (n*LO2 - m*LO1 = 10.7 MHz), where m and n are any whole numbers.
> > > > Â These formulas "assume" that the Master oscillator is "right on"
> > at 64 MHz and the Final IF Filter is exactly 10.7 MHz. This dictates
> > that LO1 will always be exactly 1013.3 MHz above the Commanded
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> > > > Here are some calculated known potential spurs:
> > > > Spur at 8.025 MHz: 4*LO2 - 4*LO1=10.7 MHz = 4*1024 - (4*1021.325)
> > = 10.7
> > > > Spur at 9.3625 MHz: 8*LO2 - 8*LO1=10.7 MHz = 8*1024 -
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> > > > Spur at 10.7 MHz : DDS 1 spurious (see below)
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> > > > Spur at 16.05 MHz : 2*LO1 - 2*LO2
> > > > Spur at 21.4 MHz : 1*LO1 - 1*LO2 (this is the image frequency that
> > the cavity filter is designed to eliminate)
> > > > Â As you can see, these spurs are the ones you have, but are a
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> > Final Filter center is not exactly 10.700 MHz.
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> > 1 to 1002.6 MHz. DDS 1 (10.7) creates an upper sideband (although
> > small) at (1002.6 MHz + 10.7 MHz) = 1013.3 MHz. This sideband zips
> > right through the Cavity Filter and mixes with PLO 2 in mixer 2,
> > creating a signal at 10.7 MHz. Bingo, the spur.
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> > the 3 dB points of the spur. If the spur BW is less than the BW of
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> > For example, your Final Filter BW is 7 KHz. Your spur shows a BW to be
> > 1.4 KHz. This is one fifth. So you are dealing with a 5th harmonic.
> > > > Scotty
> > > >
> > > > --- On Thu, 11/24/11, Sam <swetterlin@> wrote:
> > > >
> > > > From: Sam <swetterlin@>
> > > > Subject: [spectrumanalyzer] Re: Spurs
> > > > To: spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>
> > > > Date: Thursday, November 24, 2011, 5:05 PM
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> > > > > Oscillator, phase detector, A/D converter fenced but still open.
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> > > > > All RF connections use UT141, solid copper tubing.
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> > > > > Thanks, Jurgen
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8755. Re: Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-26 01:58:50 UTC
From: Sam
Topic: 8735 Message: 8755

Yes, the harmonic content of the PLO signals is large. And of course by being used as the LO in a mixer there will be even more generated. The real question is how much of the harmonics escape into the mixer output.
Sam W.

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> outputs. They had a large amount of second and third harmonic content.
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8756. Re: Crystal filters [1 Attachment]

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-26 15:25:26 UTC
From: neganur
Topic: 5999 Message: 8756

Someone from the UK is selling NDK10P7D on ebay, in case you missed them. Stock is 100 pieces or so.

Chris

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
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> If I am correct it looks like the somewhere greater than 90 db.
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8757. Re: Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-26 19:32:29 UTC
From: Sam
Topic: 8735 Message: 8757

Jurgen,
If you want to watch the N*LO1-N*LO2 spurs while taking some action to get rid of them, and you don't want the really slow scans that result from using a huge number of steps, here is the way to set up the scan:

1. Set your desired RBW path and look in Show Variables to see the Real Final IF frequency.

2. Use the Real Final IF as the center of the scan and as the scan width.

3. Use 840 steps.

This will make the step size IF2/840. An integral number of such steps can equal IF2/2, IF2/3,... or IF2/8. All the spurs of interest will differ from IF2 by one of those values (+ or -) and therefore you will hit all the spurs on the head.

This won't hit the 21.4 MHz spur. If you want that one, double the scan width and double the number of steps to 1680.

Jurgen, in your case the only relevant multiples seem to be 2, 4 and 8, and possibly 7 so you could use a mere 56 steps (the least common multiple of those numbers) instead of 840.

Sam W.

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> > > > Here are some calculated known potential spurs:
> > > > Spur at 8.025 MHz: 4*LO2 - 4*LO1=10.7 MHz = 4*1024 - (4*1021.325) = 10.7
> > > > Spur at 9.3625 MHz: 8*LO2 - 8*LO1=10.7 MHz = 8*1024 - (8*1022.6625)
> > > = 10.7
> > > > Spur at 10.7 MHz : DDS 1 spurious (see below)
> > > > Spur at 12.0375 MHz : 8*LO1 - 8*LO2
> > > > Spur at 16.05 MHz : 2*LO1 - 2*LO2
> > > > Spur at 21.4 MHz : 1*LO1 - 1*LO2 (this is the image frequency that
> > > the cavity filter is designed to eliminate)
> > > > Â As you can see, these spurs are the ones you have, but are a tiny
> > > bit different in frequency. This is due to the fact that your Final
> > > Filter center is not exactly 10.700 MHz.
> > > >
> > > > Â A little more on the DDS 1 spur at 10.7. If you expand your scale
> > > at this spur, you will probably find that the actual center frequency
> > > of the spur is the same frequency where DDS 1 is commanded to. Verify
> > > this by opening the Variables window and note the "dds1output = xx".
> > > Another method to verify that this spur is actually the DDS 1
> > > frequency, halt the sweep, open the Sweep Parameters Window and click
> > > the Spur Test button. Continue the sweep and notice the spur has
> > > moved. The Spur Test changes the PLO 1 phase detector frequency, which
> > > changes the DDS 1 frequency.
> > > > Â The DDS 1 spur is created by the DDS 1 modulating the PLO 1 and
> > > creating sidebands. You can also see this spur by commanding the MSA
> > > Center Frequency to -10.7 MHz. Yes, this is allowed, although there is
> > > no such thing as a negative frequency. However, this commands the PLO
> > > 1 to 1002.6 MHz. DDS 1 (10.7) creates an upper sideband (although
> > > small) at (1002.6 MHz + 10.7 MHz) = 1013.3 MHz. This sideband zips
> > > right through the Cavity Filter and mixes with PLO 2 in mixer 2,
> > > creating a signal at 10.7 MHz. Bingo, the spur.
> > > >
> > > > Â Any time you see a spur in the MSA, expand the sweep to measure
> > > the 3 dB points of the spur. If the spur BW is less than the BW of
> > > your Final Resolution Filter, then you are dealing with a harmonic.
> > > For example, your Final Filter BW is 7 KHz. Your spur shows a BW to be
> > > 1.4 KHz. This is one fifth. So you are dealing with a 5th harmonic.
> > > > Scotty
> > > >

8758. Re: [spectrumanalyzer] Re: Crystal filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-26 20:01:34 UTC
From: Jurgen
Topic: 5999 Message: 8758

Thanks for letting me know. I did buy one. I also bought 3 10P17D from
someone in Australia. I probably only need two at the most.
Need to buy the components for the matching networks.
All of this plus my spurs are going to keep me busy for a while.
Jurgen

On 11/26/2011 10:25 AM, neganur wrote:
>
> Someone from the UK is selling NDK10P7D on ebay, in case you missed
> them. Stock is 100 pieces or so.
>
> Chris
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@...> wrote:
> >
> > If I am correct it looks like the somewhere greater than 90 db.
> > There is the beginning of a lobe on the right hand side.
> >
> > There are 3 filters 10P17D for sale on ebay.
> > I wonder what the difference is between the two, yours is a 10P7D.
> > I could not find any data sheets.
> > Jurgen
>
>

8759. Re: Spurs (N*LO1-N*LO2)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-26 22:40:02 UTC
From: Sam
Topic: 8735 Message: 8759

After some experimentation, I have revised my method of searching for the N*LO1-N*LO2 (or N*LO2-N*LO1) spurs:

1. Set the center and span to the final filter center frequency that you specified in the list of paths. Don't use a path with RBW less than 1 kHz unless you limit the scan to a small number of points (see (5) below).

2. You can use the 840 steps I suggested before. But when looking for spurs you may have to watch several scans to see whether spikes at a given frequency come and go. For this purpose it is more convenient to have a fast scan with clearly separated scan points.

3. To pick up the spurs from a given set of multiples N1, N2, ...N3, you need a number of steps equal to the least common multiple of those values, and if that comes out an odd number, you have to double it to make it even (in order that your center frequency is actually a scan point).

4. To pick up all multiples 2 through 8 requires steps equal to their least common multiple, which is 840. But that gives scan points crowded together.

5. It is best to break the scan into two parts. For example, using 3*4*5=60 steps will pick up spurs involving multiples 2, 3, 4, 5 and 6, and a separate scan of 7*8=56 steps will pick up multiples of 2, 4, 7 and 8 (which all divide 56 evenly). Since the second scan picks up multiples of 2 and 4, they can be dropped from the first scan, giving only 3*5=15 steps, but you have to double that to make it even.

6. With scans of a small number of steps, the scan is fast and well separated and it is easy tell whether individual points are stable or varying around a measurable value, in which case they are spurs, or whether they appear and disappear, in which case they are noise (though low level invisible spurs are still possible at those points).

7. Graphing as a histogram works best visually when you have such a small number of points.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Jurgen,
> If you want to watch the N*LO1-N*LO2 spurs while taking some action to get rid of them, and you don't want the really slow scans that result from using a huge number of steps, here is the way to set up the scan:
>
> 1. Set your desired RBW path and look in Show Variables to see the Real Final IF frequency.
>
> 2. Use the Real Final IF as the center of the scan and as the scan width.
>
> 3. Use 840 steps.

>
> This will make the step size IF2/840. An integral number of such steps can equal IF2/2, IF2/3,... or IF2/8. All the spurs of interest will differ from IF2 by one of those values (+ or -) and therefore you will hit all the spurs on the head.
>
> This won't hit the 21.4 MHz spur. If you want that one, double the scan width and double the number of steps to 1680.
>
> Jurgen, in your case the only relevant multiples seem to be 2, 4 and 8, and possibly 7 so you could use a mere 56 steps (the least common multiple of those numbers) instead of 840.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Yes, the harmonic content of the PLO signals is large. And of course by being used as the LO in a mixer there will be even more generated. The real question is how much of the harmonics escape into the mixer output.
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@> wrote:
> > >
> > > I do remember running an FFT using my scope on the PLO1 and PLO2
> > > outputs. They had a large amount of second and third harmonic content.
> > > I remember mentioning this in a post. They seem to have been within the
> > > manufacturers specifications.
> > > Need to repeat the measurements.
> > > I will put an attenuator in series with the cavity filter output and see
> > > if that validates the assumptions.
> > >
> > > Thanks for all your responses, Jurgen
> > >
> > >
> > >
> > >
> > >
> > > On 11/25/2011 3:27 PM, Sam wrote:
> > > >
> > > > It appears that the common element in all of Jurgen's spurs, except
> > > > that at 10.7 MHz, is that they depend on LO1 (or certain harmonics)
> > > > passing through Mixer 1 and the cavity filter. If it is actually LO1
> > > > leakage, I would have expected the spurs to be stronger where LO1 is
> > > > closest to 1013.3 MHz, meaning LO1 would pass most easily through the
> > > > cavity filter. But that is not the case, making me suspect that what
> > > > is really leaking is the second and/or fourth harmonic of LO1. The
> > > > fourth harmonic in particular might have an easy time passing through
> > > > the cavity filter, and would explain why the strongest spurs involve
> > > > multiples of 4 and 8.
> > > >
> > > > Perhaps a simple low pass filter at the cavity filter input or output

> > > > would solve the problem. Like the Minicircuits LFCN-1000.
> > > >
> > > > It is also possible that the amount of leakage through Mixer 1 is
> > > > sensitive to the LO level. Jurgen, if your LO1 is very strong, you
> > > > might consider reducing it 3 dB to see what happens.
> > > >
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com
> > > > <mailto:spectrumanalyzer%40yahoogroups.com>, william sprowls
> > > > <wsprowls@> wrote:
> > > > >
> > > > > Hi Jurgen and All,
> > > > > Â Spurs within the MSA (and any spectrum analyzer) are
> > > > mathematically predictable. For the MSA, any time a combination of
> > > > signals create 10.7 MHz (final I.F.) or 1013.3 MHz (1st I.F.) a
> > > > potential spur will exist. Whether or not the spurs become problematic
> > > > (visible on the graph) depends on the original design and the
> > > > implementation of that design (filtering).Â The number of predictable
> > > > spurs are related to the number of signals and the number of local
> > > > oscillators and mixers. This is why my original design of the Spectrum
> > > > Analyzer uses a dual conversion, rather than more multiple conversions
> > > > like the Big Boys use. They create more spurs, then spend a lot of
> > > > money on extra filtering to get rid of those spurs. (dumb)
> > > > >
> > > > > Â The Verification MSA (in SA Mode) does not display any of your
> > > > spurs except the one at 10.7 MHz (displayed as -112 dBm). They may be
> > > > created in the MSA but they are below the noise floor at -120 dBm.
> > > > >
> > > > > Â Sam guessed that the spur at 12.038 MHz is a product of the two
> > > > PLO's (8*LO1-8*LO2). He is right on.
> > > > >
> > > > > Â Here are the mathematics for known spurs.
> > > > > Â (m*LO1 - n*LO2 = 10.7 MHz) or
> > > > > (n*LO2 - m*LO1 = 10.7 MHz), where m and n are any whole numbers.
> > > > > Â These formulas "assume" that the Master oscillator is "right on"
> > > > at 64 MHz and the Final IF Filter is exactly 10.7 MHz. This dictates
> > > > that LO1 will always be exactly 1013.3 MHz above the Commanded
> > > > Frequency (where the spur shows up).
> > > > >
> > > > > Here are some calculated known potential spurs:
> > > > > Spur at 8.025 MHz: 4*LO2 - 4*LO1=10.7 MHz = 4*1024 - (4*1021.325) = 10.7
> > > > > Spur at 9.3625 MHz: 8*LO2 - 8*LO1=10.7 MHz = 8*1024 - (8*1022.6625)
> > > > = 10.7
> > > > > Spur at 10.7 MHz : DDS 1 spurious (see below)
> > > > > Spur at 12.0375 MHz : 8*LO1 - 8*LO2
> > > > > Spur at 16.05 MHz : 2*LO1 - 2*LO2
> > > > > Spur at 21.4 MHz : 1*LO1 - 1*LO2 (this is the image frequency that
> > > > the cavity filter is designed to eliminate)
> > > > > Â As you can see, these spurs are the ones you have, but are a tiny

> > > > bit different in frequency. This is due to the fact that your Final
> > > > Filter center is not exactly 10.700 MHz.
> > > > >
> > > > > Â A little more on the DDS 1 spur at 10.7. If you expand your scale
> > > > at this spur, you will probably find that the actual center frequency
> > > > of the spur is the same frequency where DDS 1 is commanded to. Verify
> > > > this by opening the Variables window and note the "dds1output = xx".
> > > > Another method to verify that this spur is actually the DDS 1
> > > > frequency, halt the sweep, open the Sweep Parameters Window and click
> > > > the Spur Test button. Continue the sweep and notice the spur has
> > > > moved. The Spur Test changes the PLO 1 phase detector frequency, which
> > > > changes the DDS 1 frequency.
> > > > > Â The DDS 1 spur is created by the DDS 1 modulating the PLO 1 and
> > > > creating sidebands. You can also see this spur by commanding the MSA
> > > > Center Frequency to -10.7 MHz. Yes, this is allowed, although there is
> > > > no such thing as a negative frequency. However, this commands the PLO
> > > > 1 to 1002.6 MHz. DDS 1 (10.7) creates an upper sideband (although
> > > > small) at (1002.6 MHz + 10.7 MHz) = 1013.3 MHz. This sideband zips
> > > > right through the Cavity Filter and mixes with PLO 2 in mixer 2,
> > > > creating a signal at 10.7 MHz. Bingo, the spur.
> > > > >
> > > > > Â Any time you see a spur in the MSA, expand the sweep to measure
> > > > the 3 dB points of the spur. If the spur BW is less than the BW of
> > > > your Final Resolution Filter, then you are dealing with a harmonic.
> > > > For example, your Final Filter BW is 7 KHz. Your spur shows a BW to be
> > > > 1.4 KHz. This is one fifth. So you are dealing with a 5th harmonic.
> > > > > Scotty
> > > > >
>

8760. Texscan RCB-3 Return Loss Bridge type RCB-3 + N type Mismatches.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-27 12:29:10 UTC
From: Clive
Topic: 8760 Message: 8760

Hi, don't know if any one on here has need of a Texscan RCB-3 Return Loss Bridge type RCB-3 + N type Mismatches. All included in a nice wooden box.

I am still having a clear out and discovered this item buried in a my pile of must do something with items!

I have it on eBay as item number 220902630263

Thanks and 73 Clive GW0PPO

8761. Re: [spectrumanalyzer] Re: Max. input level rbw filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-27 14:50:53 UTC
From: SFC
Topic: 8732 Message: 8761

Hi,

I'm using a 5v supply for the opamp and switching to 8v gave me an extra 3db. I'll try lowering the gain because it's already amplfying more then the insertion loss of the crystals.

Simon

----- Original Message -----
From: Sam
To: spectrumanalyzer@yahoogroups.com
Sent: Thursday, November 24, 2011 3:23 PM
Subject: [spectrumanalyzer] Re: Max. input level rbw filters

The op amp must be saturating. The MSA input level that causes saturation depends on losses in the mixers and cavity filter, and the gain of the IF2 amp.

Assuming you are using the 8V regulator, the simplest way to increase the upper end is to reduce the gain of the op amp. Sounds like you need to cut it in half (R5=560). This won't increase total range, because you will lose an equal amount of the low end. But you should probably adjust the op amp gain so the upper end of the amplifilter path approximately matches that of other paths, just for convenience.

As far as the max allowable power, the crystals in the amplifilter are probably no different from those in any other filter. For my taste, +12 dBm is too much power, but the range of the MSA depends in part on high IF2 amp gain, which means a lot of power through the filters at high input levels. That was part of my motivation with using the Expanded Log Detector, because it allowed me to get good range while decreasing the IF2 amp gain by about 10 dB. On the other hand, I haven't heard of anyone damaging a filter with the full IF2 amp gain.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "sfcillari" <sf-cillari@...> wrote:
>
> I just finished my rbw filter switch (which works perfect btw) and started to calibrate each path. When I got to the amplifilter (opa695) I hit a wall. To diagnose I connected a SG at the input of the filter and from +7db and up there was no increase at the output. So max. input level is about 7.5db. I then measured my IF amp output and it puts out +12.5db with -6db at the input of the msa. I believe that's about right. Is there a max. what the filter can handle? And what can I do to extend the range a bit?
>
> Simon
>

8762. Re: Max. input level rbw filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-27 16:11:03 UTC
From: Sam
Topic: 8732 Message: 8762

Per the schematic, the 5V regulator is only for using the OPA356 op amp, which is rail-to-rail or close to it. Also, remember that with an op amp the overall voltage gain gets cut in half by the 50 ohm output resistor. The op amp is really there for buffering, not for gain. It's probably a good idea to reduce the gain so the insertion loss of the amplifilter is comparable to your other RBW filters, or at least so that there is some actual insertion loss.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "SFC" <sf-cillari@...> wrote:
>
> Hi,
>
> I'm using a 5v supply for the opamp and switching to 8v gave me an extra 3db. I'll try lowering the gain because it's already amplfying more then the insertion loss of the crystals.
>
> Simon
>
> ----- Original Message -----
> From: Sam
> To: spectrumanalyzer@yahoogroups.com
> Sent: Thursday, November 24, 2011 3:23 PM
> Subject: [spectrumanalyzer] Re: Max. input level rbw filters
>
>
>
> The op amp must be saturating. The MSA input level that causes saturation depends on losses in the mixers and cavity filter, and the gain of the IF2 amp.
>
> Assuming you are using the 8V regulator, the simplest way to increase the upper end is to reduce the gain of the op amp. Sounds like you need to cut it in half (R5=560). This won't increase total range, because you will lose an equal amount of the low end. But you should probably adjust the op amp gain so the upper end of the amplifilter path approximately matches that of other paths, just for convenience.
>
> As far as the max allowable power, the crystals in the amplifilter are probably no different from those in any other filter. For my taste, +12 dBm is too much power, but the range of the MSA depends in part on high IF2 amp gain, which means a lot of power through the filters at high input levels. That was part of my motivation with using the Expanded Log Detector, because it allowed me to get good range while decreasing the IF2 amp gain by about 10 dB. On the other hand, I haven't heard of anyone damaging a filter with the full IF2 amp gain.
>
> Sam W.

>
> --- In spectrumanalyzer@yahoogroups.com, "sfcillari" <sf-cillari@> wrote:
> >
> > I just finished my rbw filter switch (which works perfect btw) and started to calibrate each path. When I got to the amplifilter (opa695) I hit a wall. To diagnose I connected a SG at the input of the filter and from +7db and up there was no increase at the output. So max. input level is about 7.5db. I then measured my IF amp output and it puts out +12.5db with -6db at the input of the msa. I believe that's about right. Is there a max. what the filter can handle? And what can I do to extend the range a bit?
> >
> > Simon
> >
>

8763. Re: [spectrumanalyzer] Re: Crystal filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-28 10:51:46 UTC
From: Weddig, Henning-Christof
Topic: 5999 Message: 8763

look at

http://www.ebay.co.uk/itm/10-7-MHZ-CRYSTAL-FILTER-/320229169255?pt=UK_ConsumerElectronics_SpecialistRadioEquipment_SM&hash=item4a8f255867

101 availabe 99 sold...

Henning
DK5LV

Am 26.11.2011 16:25, schrieb neganur:
> Someone from the UK is selling NDK10P7D on ebay, in case you missed
> them. Stock is 100 pieces or so.
>
> Chris
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@...> wrote:
> >
> > If I am correct it looks like the somewhere greater than 90 db.
> > There is the beginning of a lobe on the right hand side.
> >
> > There are 3 filters 10P17D for sale on ebay.
> > I wonder what the difference is between the two, yours is a 10P7D.
> > I could not find any data sheets.
> > Jurgen
>
>

8764. LO1 Leakage Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-29 01:01:51 UTC
From: Sam
Topic: 8764 Message: 8764

Hi All,
I have posted a document discussing the spurs that Jurgen has reported, and that others might experience at various levels:

<http://groups.yahoo.com/group/spectrumanalyzer/files/SamW%20Files/LO1_Leakage_Spurs.pdf>

I call these LO1 Leakage Spurs. Perhaps Mixer 1 Leakage Spurs would be a better term (because LO1 can also leak in other ways), and some might prefer the term crosstalk rather than leakage.

The document discusses the underlying mechanism, and identifies the specific frequencies involved (elaborating on Scotty's comments). We have not yet resolved the source of Jurgen's unusually high spurs, but the current suspect is the tuning of the cavity filter.

In short, if you have a spur at frequency Fspur, your final IF frequency is IF2, and Fspur differs from IF2 by IF2/N for some reasonably small integer N, then you have one of these spurs. They are all at or below 2*IF2. If you zoom in on the spur, you will see that, while a normal signal shows up with a width approximately equal to your RBW, the spur will have a width of RBW/N.

I have also created a folder called SamW Files, and moved most of my files there, to reduce file sprawl. Some file links from older messages thus may not work. I did not move the Minicircuits quotes or the current beta of the MSA software.

Sam W.

8765. Re: [spectrumanalyzer] SLIM PDM with Rev 0 pwb

Yahoo group: spectrumanalyzer (2011)
Date: 2011-11-29 01:39:20 UTC
From: Steve
Topic: 8736 Message: 8765

Thanks Scotty. Looks to be what I need.

Steve K8JQ

On 11/25/2011 10:12 AM, william sprowls wrote:
>
>
> Hi Steve,
> I updated the PDM web page:
> http://scottyspectrumanalyzer.com/slim_PDM.html
> It now links the archived documents for what you need. Be sure to do a
> "refresh" in your browser to get the latest page.
> Scotty
>
> --- On *Thu, 11/24/11, Steve /<steve65@...>/* wrote:
>
>
> From: Steve <steve65@...>
> Subject: [spectrumanalyzer] SLIM PDM with Rev 0 pwb
> To: spectrumanalyzer@yahoogroups.com
> Date: Thursday, November 24, 2011, 4:59 PM
>
> Scotty,
>
> The phase detector module I constructed a couple of years ago uses
> a Rev
> 0 PWB and does not have the improvements for phase resolution or
> one-shot stability that were developed later.
>
> I have another phase detector Rev 0 PWB with which I'd like to
> construct
> a second phase detector module with the improved operation -- I think
> that would make it a REV C SLIM. After I get the second one
> working, I
> plan to modify the first one for the same improvements.
>
> Sadly, I have lost the printed copies I had of the parts list,
> schematic
> and text description related to the Rev 0 PWB. Seems to me I need
> those
> as a starting point. Are those documents still available? If they are
> out there on the web site, perhaps you could point me to them?
>
> Thanks.
>

> Steve K8JQ
>
> --
> Read The Patriot Post Vertitas vos Liberabit
> http://patriotpost.us/subscription/
>
>
>
>

--
Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

8766. Coax filter build status

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-01 23:50:23 UTC
From: spyker49
Topic: 8766 Message: 8766

Hello Group
So far I have orders for 12 Coax filters for delivery in January 2012, thank you very much.
One order has a custom frequency!
Fully assembled and tested U$80 + U$15 overseas post from Perth Australia.
I aim to build 15-20 units so there is some stock.
A friend with a machine shop is helping me with the cutting of the 160 copper pipe sections. Before this run I cut the other 240 sections by hand.
Please reply only to redmond2@iinet.net.au
Regards Len Spyker

8767. Need ADE-11X mixer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-02 00:50:54 UTC
From: Jurgen
Topic: 8767 Message: 8767

Hello,

I am in need of two ADE-11X mixers.
If any one has some left over parts I will be happy to buy them.

Thanks, Jurgen

8768. YIG Tuned filter repair

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-02 12:05:23 UTC
From: yig_repair
Topic: 8768 Message: 8768

```
hello,everyone.I can repair YIG Tuned Filter,if you need,contac me.thanks!
5086-7981(5086-6981) YTHM 8562E,8562EC,8562EL
5086-7884(5086-6884) YTHM 8563E,8563EC
5087-7034 YTHM E4404B,E4405B,E7403A,E7404A
--------------------------------------------------------------------------------
5087-7003(5086-7803) SYTF 84300A,83810B,8590L,8594E,E4902B (6.5GHz)
5086-7880 SYTF 8596E (12.8GHz)
--------------------------------------------------------------------------------
5086-7850 YTF 11758V,7090A,83810B,8592L,8593E,E4902B
--------------------------------------------------------------------------------
5086-7930(5086-6930) SBTX BaFe Filter Mixer 40GHz 8564E,8565E
5086-7883(5086-6883) SBTX BaFe Filter Mixer 50GHz 8564EC,8565E
```

8769. Re: [spectrumanalyzer] SLIM PDM with Rev 0 pwb

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-05 02:49:27 UTC
From: Steve
Topic: 8736 Message: 8769

Scotty,

I continue to plod along on my second phase detector SLIM and would appreciate your advice to ensure I'm headed in the right direction. My goal is to have a PDM with the latest available modifications.

Keeping in mind that I have a Rev 0 PWB, here's what I plan to do:
1. Construct a Rev A phase detector module based upon SLIM-PDM Rev A, SKSLIM-PDM Rev A, PWB-PDM Rev 0 and PLSLIM-PDM Rev A.
2. Implement the four MOD's detailed at the end of the current web page in the section entitled "Updated 10-21-08 Modification of the SLIM-PDM-revA".

Do those steps sound right?

Given that I have a "blank" PWB, is there merit in building the Rev A PDM and testing it in my working MSA prior to implementing the four MOD's? Or would it make for easier construction to incorporate the four MOD's into the first-pass build?

Is there an "official" nomenclature for the Rev A PDM SLIM that has the four MOD's? Is there a rev level? Or is it just known as "Rev A with the four MOD's"? :-)

Is the performance of the "Rev A with the four MOD's" equivalent to the Rev C PDM SLIM?

Thanks.

Steve K8JQ

On 11/25/2011 10:12 AM, william sprowls wrote:
>
>
> Hi Steve,
> I updated the PDM web page:
> http://scottyspectrumanalyzer.com/slim_PDM.html
> It now links the archived documents for what you need. Be sure to do a
> "refresh" in your browser to get the latest page.
> Scotty
>
> --- On *Thu, 11/24/11, Steve /<steve65@...>/* wrote:
>
>
> From: Steve <steve65@...>
> Subject: [spectrumanalyzer] SLIM PDM with Rev 0 pwb
> To: spectrumanalyzer@yahoogroups.com

> Date: Thursday, November 24, 2011, 4:59 PM
>
> Scotty,
>
> The phase detector module I constructed a couple of years ago uses
> a Rev
> 0 PWB and does not have the improvements for phase resolution or
> one-shot stability that were developed later.
>
> I have another phase detector Rev 0 PWB with which I'd like to
> construct
> a second phase detector module with the improved operation -- I think
> that would make it a REV C SLIM. After I get the second one
> working, I
> plan to modify the first one for the same improvements.
>
> Sadly, I have lost the printed copies I had of the parts list,
> schematic
> and text description related to the Rev 0 PWB. Seems to me I need
> those
> as a starting point. Are those documents still available? If they are
> out there on the web site, perhaps you could point me to them?
>
> Thanks.
>
> Steve K8JQ
>
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8770. Re: [spectrumanalyzer] SLIM PDM with Rev 0 pwb

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-05 03:32:33 UTC
From: william sprowls
Topic: 8736 Message: 8770

Hi Steve,
 Since your board is blank, I would build it up with the mods. rather than build a RevA and then modify it. It is easiest to slice those 4 traces on an empty board. The SLIM-RevA (PWB-Rev0) with mods is just as accurate as RevC. There was no special name given to the RevA with mods, other than just to say "my RevA has all the mods". When you finish, I would mark the bottom of the pwb, "PDM-RevA", "modified", and the date you did it. Years from now you won't have to scratch your head or lift the lid to verify what it is.
Scotty

--- On Sun, 12/4/11, Steve <steve65@...> wrote:

From: Steve <steve65@...>
Subject: Re: [spectrumanalyzer] SLIM PDM with Rev 0 pwb
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, December 4, 2011, 8:49 PM

Scotty,

I continue to plod along on my second phase detector SLIM and would

appreciate your advice to ensure I'm headed in the right direction. My

goal is to have a PDM with the latest available modifications.

Keeping in mind that I have a Rev 0 PWB, here's what I plan to do:

1. Construct a Rev A phase detector module based upon SLIM-PDM Rev A,

SKSLIM-PDM Rev A, PWB-PDM Rev 0 and PLSLIM-PDM Rev A.

2. Implement the four MOD's detailed at the end of the current web page

in the section entitled "Updated 10-21-08 Modification of the

SLIM-PDM-revA".

Do those steps sound right?

Given that I have a "blank" PWB, is there merit in building the Rev A

PDM and testing it in my working MSA prior to implementing the four

MOD's? Or would it make for easier construction to incorporate the four

MOD's into the first-pass build?

Is there an "official" nomenclature for the Rev A PDM SLIM that has the

four MOD's? Is there a rev level? Or is it just known as "Rev A with the

four MOD's"? :-)

Is the performance of the "Rev A with the four MOD's" equivalent to the

Rev C PDM SLIM?

Thanks.

Steve K8JQ

On 11/25/2011 10:12 AM, william sprowls wrote:

>

>

> Hi Steve,

> I updated the PDM web page:

> http://scottyspectrumanalyzer.com/slim_PDM.html

> It now links the archived documents for what you need. Be sure to do a

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> To: spectrumanalyzer@yahoogroups.com

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8771. Re: [spectrumanalyzer] SLIM PDM with Rev 0 pwb

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 01:18:25 UTC
From: Steve
Topic: 8736 Message: 8771

Thanks for the advice. And I've learned over the years to label everything!

One more question if I may: The web page for the PDM, near the end, has a section that begins "MOD 4: Allows the Phase Detector IC (U5) to be powered by the SLIM-ADC module." The web page for the ADC, near the beginning, has a section with whose opening sentence reads "This optional modification allows the SLIM-ADC-16 to be powered directly by the Phase Detector Module's regulated +5 volts." So it appears that either module can power the other. Does it matter which powers which? Is there a preference?

Steve K8JQ

On 12/4/2011 10:32 PM, william sprowls wrote:
>
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> Hi Steve,
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> than build a RevA and then modify it. It is easiest to slice those 4
> traces on an empty board. The SLIM-RevA (PWB-Rev0) with mods is just
> as accurate as RevC. There was no special name given to the RevA with
> mods, other than just to say "my RevA has all the mods". When you
> finish, I would mark the bottom of the pwb, "PDM-RevA", "modified",
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> Scotty
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> From: Steve <steve65@...>
> Subject: Re: [spectrumanalyzer] SLIM PDM with Rev 0 pwb
> To: spectrumanalyzer@yahoogroups.com
> Date: Sunday, December 4, 2011, 8:49 PM
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> Scotty,
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> I continue to plod along on my second phase detector SLIM and would
> appreciate your advice to ensure I'm headed in the right
> direction. My
> goal is to have a PDM with the latest available modifications.
>
> Keeping in mind that I have a Rev 0 PWB, here's what I plan to do:
> 1. Construct a Rev A phase detector module based upon SLIM-PDM Rev A,
> SKSLIM-PDM Rev A, PWB-PDM Rev 0 and PLSLIM-PDM Rev A.
> 2. Implement the four MOD's detailed at the end of the current web

> page
> in the section entitled "Updated 10-21-08 Modification of the
> SLIM-PDM-revA".
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> Do those steps sound right?
>
> Given that I have a "blank" PWB, is there merit in building the Rev A
> PDM and testing it in my working MSA prior to implementing the four
> MOD's? Or would it make for easier construction to incorporate the
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> with the
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> Steve K8JQ
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8772. Re: SLIM PDM with Rev 0 pwb

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 01:24:47 UTC
From: Sam
Topic: 8736 Message: 8772

The important thing is that both the output flip-flop of the PDM and ADC have the same power supply, so the max PDM output voltage matches what the ADC expects. As I recall, I ended up powering the two modules in the opposite way that Scotty did, but I think I had to cut a trace on one of the modules to avoid the two regulators directly battling.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
>
> Thanks for the advice. And I've learned over the years to label everything!
>
> One more question if I may: The web page for the PDM, near the end, has
> a section that begins "MOD 4: Allows the Phase Detector IC (U5) to be
> powered by the SLIM-ADC module." The web page for the ADC, near the
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> the Phase Detector Module's regulated +5 volts." So it appears that
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> >
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> > than build a RevA and then modify it. It is easiest to slice those 4
> > traces on an empty board. The SLIM-RevA (PWB-Rev0) with mods is just
> > as accurate as RevC. There was no special name given to the RevA with
> > mods, other than just to say "my RevA has all the mods". When you
> > finish, I would mark the bottom of the pwb, "PDM-RevA", "modified",
> > and the date you did it. Years from now you won't have to scratch your
> > head or lift the lid to verify what it is.
> > Scotty
> >
> > --- On *Sun, 12/4/11, Steve /<steve65@...>/* wrote:
> >
> >
> > From: Steve <steve65@...>
> > Subject: Re: [spectrumanalyzer] SLIM PDM with Rev 0 pwb
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Sunday, December 4, 2011, 8:49 PM
> >
> > Scotty,
> >

> > I continue to plod along on my second phase detector SLIM and would
> > appreciate your advice to ensure I'm headed in the right
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> >
> > Keeping in mind that I have a Rev 0 PWB, here's what I plan to do:
> > 1. Construct a Rev A phase detector module based upon SLIM-PDM Rev A,
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> > 2. Implement the four MOD's detailed at the end of the current web
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> > SLIM-PDM-revA".
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> > Do those steps sound right?
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> > Given that I have a "blank" PWB, is there merit in building the Rev A
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> > Is the performance of the "Rev A with the four MOD's" equivalent
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> > >

> > > From: Steve <steve65@...
> > </mc/compose?to=steve65%40suddenlink.net>>
> > > Subject: [spectrumanalyzer] SLIM PDM with Rev 0 pwb
> > > To: spectrumanalyzer@yahoogroups.com
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> > > Date: Thursday, November 24, 2011, 4:59 PM
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8773. Re: [spectrumanalyzer] Re: SLIM PDM with Rev 0 pwb

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 02:30:52 UTC
From: william sprowls
Topic: 8736 Message: 8773

Hi Steve,
 Sam is right, it really doesn't matter which scheme you use. By theory, powering the final stage of the PDM from the ADC module should give more accuracy to the MSA (Mod 4). However, powering the ADC from the PDM is an easier modification. I have done both and can see no difference in accuracy. I may just delete Mod 4 to simplify things.
 The "no mod" scheme is to power the PDM and ADC independently from the 10v on the Control Board. Here, I did see a significant difference, due to the modules having different temperature changes. The error over a large temperature change was a little over 1 degree in phase error.
Scotty

--- On Mon, 12/5/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: SLIM PDM with Rev 0 pwb
To: spectrumanalyzer@yahoogroups.com
Date: Monday, December 5, 2011, 7:24 PM

The important thing is that both the output flip-flop of the PDM and ADC have the same power supply, so the max PDM output voltage matches what the ADC expects. As I recall, I ended up powering the two modules in the opposite way that Scotty did, but I think I had to cut a trace on one of the modules to avoid the two regulators directly battling.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:

>

> Thanks for the advice. And I've learned over the years to label everything!

>

> One more question if I may: The web page for the PDM, near the end, has

> a section that begins "MOD 4: Allows the Phase Detector IC (U5) to be

> powered by the SLIM-ADC module." The web page for the ADC, near the

> beginning, has a section with whose opening sentence reads "This

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> the Phase Detector Module's regulated +5 volts." So it appears that

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> > From: Steve <steve65@...>

> > Subject: Re: [spectrumanalyzer] SLIM PDM with Rev 0 pwb

> > To: spectrumanalyzer@yahoogroups.com

> > Date: Sunday, December 4, 2011, 8:49 PM

> >

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> > I continue to plod along on my second phase detector SLIM and would

> > appreciate your advice to ensure I'm headed in the right

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> > Keeping in mind that I have a Rev 0 PWB, here's what I plan to do:

> > 1. Construct a Rev A phase detector module based upon SLIM-PDM Rev A,

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> > > Subject: [spectrumanalyzer] SLIM PDM with Rev 0 pwb

> > > To: spectrumanalyzer@yahoogroups.com

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> > > Date: Thursday, November 24, 2011, 4:59 PM

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8774. 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 04:27:08 UTC
From: nealmartini
Topic: 8774 Message: 8774

All,

Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").

A few months ago I started looking at building another MSA and wanted to reduce its size as much as possible. The Cavity Filter is obviously a big factor in the MSA's size. I decided to try and duplicate the Cavity Filter's function utilizing a SAW based design. I found a source for a SAW from a company in England (Gooledge) that looked like it would be perfect for the job. I put together a design and PCB layout and approached Scotty with the idea. Scotty altered my design and layouts, and we iterated the design through a couple of cycles. The resulting performance we obtained turned out to be excellent.

I created a file folder called "1013 MHz SAW Filter"

http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/

on the group page for you all to look at. The folder contains various frequency responses, pictures of the PCB, and construction stage photos. I also included a data sheet for the SAW that was used. Basically, the design consists of three cascaded SAWs, a few PADs and an ERA-33 amplifier. If you look at the group file, you will get a good idea of the approach and performance.

I am curious if there would be any interest out there for putting together some sort of group buy for this filter. A group buy would be for the SAWs (three required/filter-I paid $5.75/each ordering in small quantity), a PCB (>$5.00/each), plus shipping. The quantity we order will obviously drive the SAW cost. The rest of the parts needed to complete the assembly (caps, resistors, connectors,etc.) are very similar to the MSA's current IF ERA-33SM based amplifier. If there is enough interest, I would be willing to facilitate the group buy of the SAWs and PCBs.

Before we formally begin a group buy, those of you out there with interest please post a response so we can get an idea of what quantities we may be talking about. BTW, Scotty is considering adding this to the formal SLIM list. He is working on putting the PCB layout, schematic and parts lists in the form consistent with what he uses for SLIMs.

Neal

8775. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 10:23:52 UTC
From: neganur
Topic: 8774 Message: 8775

Excellent idea, I'd take at least two.

I finally managed to finish assembling my cavity filter yesterday evening and I'm in the process of documenting it. Sam gave me some excellent advice regarding the hair-pin decouplers a few days ago.

Chris

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> All,
>
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>
> Neal
>

8776. Re: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 13:25:04 UTC
From: Robert Cerreto
Topic: 8774 Message: 8776

Neal,

Please record me as one of the group buy people. I would like material for two filters.

Thank you for all your efforts.

Bob WA!FXT

From: nealmartini <nealmartini@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Monday, December 5, 2011 11:27 PM
Subject: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

All,

Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").

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ERA-33SM based amplifier. If there is enough interest, I would be willing to facilitate the group buy of the SAWs and PCBs.

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Neal

8777. Re: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 14:34:35 UTC
From: f4cny
Topic: 8774 Message: 8777

Neal,

And me too !!

thanks for all.

Ennio
F4CNY

> Message du 06/12/11 14:25
> De : "Robert Cerreto"
> A : "spectrumanalyzer@yahoogroups.com"
> Copie à :
> Objet : Re: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
>
> >
Neal,
> Please record me as one of the group buy people. I would like material for two filters.
> Thank you for all your efforts.
> Bob WA!FXT
> From: nealmartini
> To: spectrumanalyzer@yahoogroups.com
> Sent: Monday, December 5, 2011 11:27 PM
> Subject: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
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> All,
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>
> Neal
>
>
>
>

8778. Re: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 14:52:09 UTC
From: Mike
Topic: 8774 Message: 8778

Hi Neal,
Please add me to the list for one.

Mike Guzy
mjguzy<at>charter.net

On 12/5/2011 10:27 PM, nealmartini wrote:
>
>
>
> I am curious if there would be any interest out there for putting
> together some sort of group buy for this filter. A group buy would be
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> this to the formal SLIM list. He is working on putting the PCB layout,
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> SLIMs.
>
> Neal
>
>

8779. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 15:24:49 UTC
From: william
Topic: 8774 Message: 8779

Hi All,
I think Neal has hit a home run. For potential MSA builders who have been afraid of tackling the Cavity Filter, this is a great alternative.
I was a bit skeptical at first. These SAW filters are the smallest I have ever seen (3 mm square) and I thought that assembly might be a problem. However, Neal says they reflow quite nicely and they also are easy to install with a standard small tip iron.
Please take a good look at Neal's photos during his assembly. His soldering and fencing are not great. And, with construction of items this small, I'm not surprised. I don't say this to step on Neal's toes, but rather, to bring up the point that "perfect" construction is not critical to get great results.
I do believe this will make a good SLIM design. The company that distributes these SAWs have a long list of other SAWs with the same footprint. So, utilizing this SLIM with different SAWs would be pretty handy for other projects. (example, Filter and Amplifier for a frequency multiplier scheme).
I have added two more of Neal's plotted test results to his previously named file section. One is a sweep of the Single SAW Filter and Amplifier. This shows a really good response of the single filter. This plot response is extremely close to what the Vendor specifies. What is important (to me, anyway) is that other SAW filters from this Vendor can probably be trusted to be specified correctly.
The other addition is the response of two SAWs cascaded (the smaller module). In other projects, the ultimate rejection for two SAWs might be sufficient without adding the SAW/Amplifier module.
I will be creating a Web page for the SLIM design and will release a full set of documentation.
Scotty

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> All,
>
> Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").
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>
> Neal
>

8780. RE: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 15:26:14 UTC
From: Warren C. Pratt
Topic: 8774 Message: 8780

Hi Neal,

Please add me to your list for a quantity of TWO. Many thanks for this excellent development!

Warren

warren@...

From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of nealmartini
Sent: Monday, December 05, 2011 8:27 PM
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

.

I am curious if there would be any interest out there for putting together some sort of group buy for this filter. A group buy would be for the SAWs (three required/filter-I paid $5.75/each ordering in small quantity), a PCB (>$5.00/each), plus shipping. The quantity we order will obviously drive the SAW cost. The rest of the parts needed to complete the assembly (caps, resistors, connectors,etc.) are very similar to the MSA's current IF ERA-33SM based amplifier. If there is enough interest, I would be willing to facilitate the group buy of the SAWs and PCBs.

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Neal

8781. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 15:28:43 UTC
From: mdgolfbum
Topic: 8774 Message: 8781

I'm in for one filter kit.

jim ab3cv

8782. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 15:35:36 UTC
From: wb4jfi
Topic: 8774 Message: 8782

Wonderful work Neal. I would like two filter sets.
Terry, WB4JFI

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> All,
>
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> Neal
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8783. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 15:38:40 UTC
From: n1rx
Topic: 8774 Message: 8783

I am in for two.
Bruce, N1RX

8784. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 15:40:12 UTC
From: john4guys@aol.com
Topic: 8774 Message: 8784

Neal,
I'm just starting looking at building a MSA and this looks like more my skill set compared to the Cavity Filter. :-) You can add me to any group buy.
thanks
John N1EEV

8785. Re: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 16:21:02 UTC
From: Neal
Topic: 8774 Message: 8785
Attachments: 1 described; binary payloads are missing from this source WARC

All-I added a rough schematic of the filter in the folder for those that requested it.

Sam-I asked for a quote and placed the order for the SAWs. I don’t know what their internal inventory situation was. It took about two weeks to receive parts.

Greg-Sorry for the big files. I will use .gif as you suggest in the future. Thanks

Scotty-I am looking around to find a class in “soldering and fencing”

Neal

From: nealmartini
Sent: Monday, December 05, 2011 9:27 PM
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

All,

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Neal

8786. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 16:22:51 UTC
From: ventura2204
Topic: 8774 Message: 8786

Neal,
count me for two filter sets.

Gabriele

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> All,
>
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> Neal
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8787. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 16:30:19 UTC
From: Elias Retana
Topic: 8774 Message: 8787

Neal
count me for a 1013 Mhz filter set.

Elias

8788. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 16:36:45 UTC
From: Charles Robideaux
Topic: 8774 Message: 8788

Please add me in the group buy for three sets.

Tnx and Best Regards,

Chuck w8dux

8789. Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 16:37:42 UTC
From: w4zcb
Topic: 8774 Message: 8789

Neal,
count me for two filter sets.

I don't even need them, have several cavity ones lying around, but my obsessive compulsive just hit a high note.

W4ZCB

8790. Re: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 16:50:32 UTC
From: Jim Hontoria
Topic: 8774 Message: 8790

Count me in for two
Jim Hontoria, W1JGH

On Mon, Dec 5, 2011 at 11:27 PM, nealmartini <nealmartini@...>wrote:

> **
>
>
> All,
>
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> list. He is working on putting the PCB layout, schematic and parts lists in
> the form consistent with what he uses for SLIMs.
>
> Neal
>
>
>

--
Jim G. Hontoria

8791. RE: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 17:38:24 UTC
From: NeilDouglas
Topic: 8774 Message: 8791

Neal,

I am interested in two filter sets.

Thanks

NeilD

From: spectrumanalyzer@yahoogroups.com
[mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of nealmartini
Sent: 06 December 2011 04:27
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

All,

Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").

A few months ago I started looking at building another MSA and wanted to reduce its size as much as possible. The Cavity Filter is obviously a big factor in the MSA's size. I decided to try and duplicate the Cavity Filter's function utilizing a SAW based design. I found a source for a SAW from a company in England (Gooledge) that looked like it would be perfect for the job. I put together a design and PCB layout and approached Scotty with the idea. Scotty altered my design and layouts, and we iterated the design through a couple of cycles. The resulting performance we obtained turned out to be excellent.

I created a file folder called "1013 MHz SAW Filter"

http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/

on the group page for you all to look at. The folder contains various frequency responses, pictures of the PCB, and construction stage photos. I also included a data sheet for the SAW that was used. Basically, the design consists of three cascaded SAWs, a few PADs and an ERA-33 amplifier. If you

look at the group file, you will get a good idea of the approach and performance.

I am curious if there would be any interest out there for putting together some sort of group buy for this filter. A group buy would be for the SAWs (three required/filter-I paid $5.75/each ordering in small quantity), a PCB (>$5.00/each), plus shipping. The quantity we order will obviously drive the SAW cost. The rest of the parts needed to complete the assembly (caps, resistors, connectors,etc.) are very similar to the MSA's current IF ERA-33SM based amplifier. If there is enough interest, I would be willing to facilitate the group buy of the SAWs and PCBs.

Before we formally begin a group buy, those of you out there with interest please post a response so we can get an idea of what quantities we may be talking about. BTW, Scotty is considering adding this to the formal SLIM list. He is working on putting the PCB layout, schematic and parts lists in the form consistent with what he uses for SLIMs.

Neal

8792. Re: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 17:58:31 UTC
From: Jurgen
Topic: 8774 Message: 8792

Please include me for two units.

Thanks, Jurgen

On 12/5/2011 11:27 PM, nealmartini wrote:
>
> All,
>
> Let me start out with the bottom line. With a lot of help from Scotty,
> I put together a working prototype of a 1013 MHz SAW based filter that
> can be used in place of the Cavity Filter that is currently in the
> MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of
> rejection at the MSA second mixer's image frequency (around 1034 MHz),
> and has near 0 dB insertion loss (contains an amplifier). The PCB
> footprint is equivalent to one SLIM size board (1.2" x 1.2").
>
> A few months ago I started looking at building another MSA and wanted
> to reduce its size as much as possible. The Cavity Filter is obviously
> a big factor in the MSA's size. I decided to try and duplicate the
> Cavity Filter's function utilizing a SAW based design. I found a
> source for a SAW from a company in England (Gooledge) that looked like
> it would be perfect for the job. I put together a design and PCB
> layout and approached Scotty with the idea. Scotty altered my design
> and layouts, and we iterated the design through a couple of cycles.
> The resulting performance we obtained turned out to be excellent.
>
> I created a file folder called "1013 MHz SAW Filter"
>
> http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/
>
>
> on the group page for you all to look at. The folder contains various
> frequency responses, pictures of the PCB, and construction stage
> photos. I also included a data sheet for the SAW that was used.
> Basically, the design consists of three cascaded SAWs, a few PADs and
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> I am curious if there would be any interest out there for putting
> together some sort of group buy for this filter. A group buy would be
> for the SAWs (three required/filter-I paid $5.75/each ordering in
> small quantity), a PCB (>$5.00/each), plus shipping. The quantity we
> order will obviously drive the SAW cost. The rest of the parts needed
> to complete the assembly (caps, resistors, connectors,etc.) are very

> similar to the MSA's current IF ERA-33SM based amplifier. If there is
> enough interest, I would be willing to facilitate the group buy of the
> SAWs and PCBs.
>
> Before we formally begin a group buy, those of you out there with
> interest please post a response so we can get an idea of what
> quantities we may be talking about. BTW, Scotty is considering adding
> this to the formal SLIM list. He is working on putting the PCB layout,
> schematic and parts lists in the form consistent with what he uses for
> SLIMs.
>
> Neal
>
>

8793. Re: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 18:00:24 UTC
From: Geoff Moore
Topic: 8774 Message: 8793

Neal

Please add my name for one set,

Geoff
M0ORE

8794. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 18:00:28 UTC
From: g3wie
Topic: 8774 Message: 8794

Please count me in for one filter and three extra PCB. Looking through Golledge's range of filters I can think of several other uses

Chris G3WIE

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:

> Before we formally begin a group buy, those of you out there with interest please post a response so we can get an idea of what quantities we may be talking about.

8795. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 18:34:56 UTC
From: undercoupled
Topic: 8774 Message: 8795

Neal,

Please add me for 3 sets.

These filters may be manufactured by Tai-Saw, who I believe are in Tiawan.
www.taisaw.com
Model # TA0477A, under the RF SAW Filters section.
Don't know if they are available directly. Perhaps someone familiar with the language could check.

Jerry

8796. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 18:52:34 UTC
From: n6tdt
Topic: 8774 Message: 8796

Or you could just click on the link that says "English" on the upper right hand side of the page..

Sorry, Jerry couldn't resist

--- In spectrumanalyzer@yahoogroups.com, "undercoupled" <undercoupled@...> wrote:
>
> Neal,
>
> Please add me for 3 sets.
>
> These filters may be manufactured by Tai-Saw, who I believe are in Tiawan.
> www.taisaw.com
> Model # TA0477A, under the RF SAW Filters section.
> Don't know if they are available directly. Perhaps someone familiar with the language could check.
>
> Jerry
>

8797. about C27 and R12 on PLO 2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 19:14:25 UTC
From: marcolanie
Topic: 8797 Message: 8797

Hi

The MSA documentation insists on the fact that C27 and R12 must be kept for PL0 1 ans PLO3. The chapter covering PLO2 operation says

"omit C27 and R12. The driver to this circuit will absorb the mismatch reflection. This may seem a like poor design but it is valid. It improves the noise performance of the PLL."

Is this sentence "up to date" or is it a fossil noise from a former modifications ? Should I keep C27 and R12 on PLO2 ?

Thanks in advance

Marc (lost in translation ;-o)

8798. Re: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 19:41:18 UTC
From: n1ist@comcast.net
Topic: 8774 Message: 8798

I'll take one. Thanks.

/mike

----- Original Message -----

From: "nealmartini" <nealmartini@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Monday, December 5, 2011 11:27:08 PM
Subject: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

All,

Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").

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I created a file folder called "1013 MHz SAW Filter"

http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/

on the group page for you all to look at. The folder contains various frequency responses, pictures of the PCB, and construction stage photos. I also included a data sheet for the SAW that was used. Basically, the design consists of three cascaded SAWs, a few PADs and an ERA-33 amplifier. If you look at the group file, you will get a good idea of the approach and performance.

I am curious if there would be any interest out there for putting together some sort of group buy for this filter. A group buy would be for the SAWs (three required/filter-I paid $5.75/each ordering in small quantity), a PCB (>$5.00/each), plus shipping. The quantity we order will obviously drive the SAW cost. The rest of the parts needed to complete the assembly (caps, resistors, connectors,etc.) are very similar to the MSA's current IF ERA-33SM based amplifier. If there is enough interest, I would be willing to facilitate the group buy of the SAWs and PCBs.

Before we formally begin a group buy, those of you out there with interest please post a response so we can get an idea of what quantities we may be talking about. BTW, Scotty is considering adding this to the formal SLIM list. He is working on putting the PCB layout, schematic and parts lists in the form consistent with what he uses for SLIMs.

Neal

8799. Re: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 20:47:41 UTC
From: J Varkevisser
Topic: 8774 Message: 8799

Hi Neal,
Please add me to the list for one.

Jan pa0jrv

8800. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 21:51:21 UTC
From: dualraoul
Topic: 8774 Message: 8800

Please put me down for 2 Neal.

Thanks,
Ron
K0IDT

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> All,

> Before we formally begin a group buy, those of you out there with interest please post a response so we can get an idea of what quantities we may be talking about. BTW, Scotty is considering adding this to the formal SLIM list. He is working on putting the PCB layout, schematic and parts lists in the form consistent with what he uses for SLIMs.
>
> Neal
>

8801. Re: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 22:12:02 UTC
From: Alan Hochhalter
Topic: 8774 Message: 8801

I'll sign up for a set.

Alan

8802. Re: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 22:16:03 UTC
From: Bill Maxwell
Topic: 8774 Message: 8802

Hi Neal

I'll also sign up for 2 sets of SAWs or 2 kits if that is what you
decide to do.

Bill

On 7/12/2011 2:26 AM, Warren C. Pratt wrote:
>
>
> Hi Neal,
>
> Please add me to your list for a quantity of TWO. Many thanks for
> this excellent development!
>
> Warren
>
> warren@... <mailto:warren@...>
>
> *From:*spectrumanalyzer@yahoogroups.com
> [mailto:spectrumanalyzer@yahoogroups.com] *On Behalf Of *nealmartini
> *Sent:* Monday, December 05, 2011 8:27 PM
> *To:* spectrumanalyzer@yahoogroups.com
> *Subject:* [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the
> MSA Cavity Filter
>
> ...
>
>
> I am curious if there would be any interest out there for putting
> together some sort of group buy for this filter. A group buy would be
> for the SAWs (three required/filter-I paid $5.75/each ordering in
> small quantity), a PCB (>$5.00/each), plus shipping. The quantity we
> order will obviously drive the SAW cost. The rest of the parts needed
> to complete the assembly (caps, resistors, connectors,etc.) are very
> similar to the MSA's current IF ERA-33SM based amplifier. If there is
> enough interest, I would be willing to facilitate the group buy of the
> SAWs and PCBs.
>
> Before we formally begin a group buy, those of you out there with
> interest please post a response so we can get an idea of what
> quantities we may be talking about. BTW, Scotty is considering adding
> this to the formal SLIM list. He is working on putting the PCB layout,
> schematic and parts lists in the form consistent with what he uses for

> SLIMs.
>
> Neal
>
>
>
>

8803. Re: [spectrumanalyzer] about C27 and R12 on PLO 2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 22:17:46 UTC
From: william sprowls
Topic: 8797 Message: 8803

Hi Marc,
 The original reason to delete C27 and R12 on all PLO modules was for power conservation and phase noise minimization. It does this.
However, during testing, I found that PLO1 and PLO3 harmonic and spurious was decreased a little with the components re-installed. It was not a big decrease, but enough to justify the re-installation. I could find no difference with or without in PLO2. Therefore, leave them out of PLO 2
Scotty

--- On Tue, 12/6/11, marcolanie <Marc.olanie@...> wrote:

From: marcolanie <Marc.olanie@...>
Subject: [spectrumanalyzer] about C27 and R12 on PLO 2
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, December 6, 2011, 1:14 PM

Hi

The MSA documentation insists on the fact that C27 and R12 must be kept for PL0 1 ans PLO3. The chapter covering PLO2 operation says

"omit C27 and R12. The driver to this circuit will absorb the mismatch reflection. This may seem a like poor design but it is valid. It improves the noise performance of the PLL."

Is this sentence "up to date" or is it a fossil noise from a former modifications ? Should I keep C27 and R12 on PLO2 ?

Thanks in advance

Marc (lost in translation ;-o)

8804. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 22:20:43 UTC
From: allenkeehall
Topic: 8774 Message: 8804

Those are clearly excellent results. Although the cavity filter impresses the girls, it's making me rethink my bad experience with SAW devices in the past.

This is the manufacturer and they do have sales/distribution support in the U.S. Perhaps it may not be hard to scrounge some up on this side of the pond.

Tai-Saw Technology Co., LTD.
Model No.: TA0477A
http://www.taisaw.com/product.php?pc=1&p=8

http://www.taisaw.com/product.php?f=upload/product/TA0477A%20_Rev.1.0_.pdf

8805. RE : [spectrumanalyzer] about C27 and R12 on PLO 2

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 22:20:35 UTC
From: Marc OLANIE
Topic: 8805 Message: 8805
Attachments: 1 described; binary payloads are missing from this source WARC

Thanks Scotty.

Everything's clear now :-)

Marc
A good working kernel is not supposed to crash unless it says "please"
(traduction : Da Power, Fantudjûû ! RuleZ Tartiflette !)

De: spectrumanalyzer@yahoogroups.com de la part de william sprowls
Date: mar. 06/12/2011 23:17
À: spectrumanalyzer@yahoogroups.com
Objet : Re: [spectrumanalyzer] about C27 and R12 on PLO 2

Hi Marc,
The original reason to delete C27 and R12 on all PLO modules was for power conservation and phase noise minimization. It does this.
However, during testing, I found that PLO1 and PLO3 harmonic and spurious was decreased a little with the components re-installed. It was not a big decrease, but enough to justify the re-installation. I could find no difference with or without in PLO2. Therefore, leave them out of PLO 2
Scotty

--- On Tue, 12/6/11, marcolanie <Marc.olanie@...> wrote:

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Subject: [spectrumanalyzer] about C27 and R12 on PLO 2
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, December 6, 2011, 1:14 PM

Hi

The MSA documentation insists on the fact that C27 and R12 must be kept for PL0 1 ans PLO3. The chapter covering PLO2 operation says

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Is this sentence "up to date" or is it a fossil noise from a former modifications ? Should I keep C27 and R12 on PLO2 ?

Thanks in advance

Marc (lost in translation ;-o)

8806. Re: Attenuators

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 22:24:35 UTC
From: neganur
Topic: 2656 Message: 8806

I realise that this post is rather old so apologies for reviving it.

I acquired one of these units and did some frequency response measurements on the network analysers I have at my disposal in the uni. For anyone interested, I uploaded the graphs in the files section as HP_33321-60045_Programmable_Step_Attenuator.pdf

Accuracy from 300 kHz to 3 GHz was within +/- 0.1 ... +/- 0.2 dB.

Best regards
Chris

--- In spectrumanalyzer@yahoogroups.com, "Sam Wetterlin" <swetterlin@...> wrote:
>
> Hi All,
> Greg Broburg tipped me off about the HP 33321 programmable
> attenuators, used in a lot of HP equipment. They are programmable in
> 10 db steps from 0 to 70db, with extremely good accuracy. There is an
> incredible variety of models, with different frequency ranges and
> operating voltages. I bought the HP 33321-0045, which operates 0-4GHz
> and the switching mechanism uses 15V. Actually, 12V works fine. It is
> a very nifty, compact gadget. Changing attenuation produces a very
> delicate little click; no clunking. If anyone is thinking of adding a
> variable attenuator to the SA, this is a good way to go.
>
> The prices of these things vary all over the lot, and a 26GHz model
> can cost you $450 on eBay, or many times that elsewhere. But the 4GHz
> model is perfect for our purposes. There are several now available at
> <http://www.amtronix.com/attenuators.htm>
> which is where I bought mine, for $75. So if anyone is interested, go
> for it.
>
> You can manually apply the operating voltage and then ground connector
> pins as desired to set or clear one of the internal 10-20-40db
> attenuators, which is how I tested mine. You could operate it with
> three SPDT switches, one per internal attenuator. Digitally operating
> the attenuator requires a simple interface board--an inverter IC and a
> Darlington relay driver IC--which I have designed but not yet built.
> This board may work with other models as well, but I only found
> pin-out specs for the 33321-0045. If anyone has a good source for
> specs for HP parts, please let me know.
>
> Sam W.
>

8807. Advice on a Group Buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 22:32:03 UTC
From: nealmartini
Topic: 8807 Message: 8807

Would some of you that have handled one of these group buys please contact me directly (nealmartini@...) so I can ask a few questions on logistics?

Thanks
Neal

8808. Re: Attenuators

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 23:07:49 UTC
From: Sam
Topic: 2656 Message: 8808

I'm glad you did revive it. Those are very good test results. There are still some available at
www.amtronix.com/attenuators.htm

I've gotten to know the fellow who runs Amtronix and he's a good guy. His price is $75; you can pay two or three times that on eBay.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "neganur" <neganur@...> wrote:
>
> I realise that this post is rather old so apologies for reviving it.
>
> I acquired one of these units and did some frequency response measurements on the network analysers I have at my disposal in the uni. For anyone interested, I uploaded the graphs in the files section as HP_33321-60045_Programmable_Step_Attenuator.pdf
>
> Accuracy from 300 kHz to 3 GHz was within +/- 0.1 ... +/- 0.2 dB.
>
> Best regards
> Chris
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam Wetterlin" <swetterlin@> wrote:
> >
> > Hi All,
> > Greg Broburg tipped me off about the HP 33321 programmable
> > attenuators, used in a lot of HP equipment. They are programmable in
> > 10 db steps from 0 to 70db, with extremely good accuracy. There is an
> > incredible variety of models, with different frequency ranges and
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> > The prices of these things vary all over the lot, and a 26GHz model
> > can cost you $450 on eBay, or many times that elsewhere. But the 4GHz
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> > which is where I bought mine, for $75. So if anyone is interested, go
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> > You can manually apply the operating voltage and then ground connector
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> > the attenuator requires a simple interface board--an inverter IC and a
> > Darlington relay driver IC--which I have designed but not yet built.
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> > pin-out specs for the 33321-0045. If anyone has a good source for
> > specs for HP parts, please let me know.
> >
> > Sam W.
> >
>

8809. Re: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 23:08:17 UTC
From: Robert Fish
Topic: 8774 Message: 8809

Put me down for one. I have two copper ones, maybe I'll put bird feed in them and hang'em in a tree.

Thanks,

Bob K6GGO

> I'll sign up for a set.
>
> Alan
>
>

8810. RE: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 23:43:51 UTC
From: Mark Burgin
Topic: 8774 Message: 8810

I would be interested in two sets.

Thanks
Mark

From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of nealmartini
Sent: 06 December 2011 04:27
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

All,

Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").

A few months ago I started looking at building another MSA and wanted to reduce its size as much as possible. The Cavity Filter is obviously a big factor in the MSA's size. I decided to try and duplicate the Cavity Filter's function utilizing a SAW based design. I found a source for a SAW from a company in England (Gooledge) that looked like it would be perfect for the job. I put together a design and PCB layout and approached Scotty with the idea. Scotty altered my design and layouts, and we iterated the design through a couple of cycles. The resulting performance we obtained turned out to be excellent.

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http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/

on the group page for you all to look at. The folder contains various frequency responses, pictures of the PCB, and construction stage photos. I also included a data sheet for the SAW that was used. Basically, the design consists of three cascaded SAWs, a few PADs and an ERA-33 amplifier. If you look at the group file, you will get a good idea of the approach and performance.

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Neal

8811. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-06 23:51:19 UTC
From: Ron
Topic: 8774 Message: 8811

I'd better grab one set even though I have a fully working MSA. It will give me more room in the box for add ons - I've run out.

Ron, VK7ZRO.

8812. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 00:35:09 UTC
From: Mike
Topic: 8774 Message: 8812

Hello Neal

Please list me as interested in the group buy, for materials for two filters.

Thanks for your efforts.

MikeN, zl1bnb

8813. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 01:15:39 UTC
From: mdgolfbum
Topic: 8774 Message: 8813

If you only have a single SSA is there a reason to buy more than one kit?

Is it useful for a sig gen to be used with the SSA perhaps?

Jim ab3cv

8814. Coax Filter build and 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 03:15:37 UTC
From: Len
Topic: 8814 Message: 8814

Hello Group: Coax filter buyers note:

I have received orders for 13 coax filter units. Now this SAW filter turns up out of the blue.

Some coax buyers may be in a conundrum.

The Coax filter build is a hobby for me ($0 on my time) any profit is on the machined parts.

Therefore I will accept the cancellation for a coax filter order, but please let me know before 15 DEC.

Regards

Len Spyker

8815. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 03:49:22 UTC
From: Martin
Topic: 8774 Message: 8815

Hi Neal

I would be interested in 2 units.

It may be an advantage to the AU people if the ERA-33SM was included in the group buy. The Minicircuits representative in AU were very helpful and met the 'all the parts' quote offered by Minicircuits, however the cost for one off, low volume orders is much higher - not a complaint, just an observation.

Thanks

Marty

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> All,
>
> Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").
>
> A few months ago I started looking at building another MSA and wanted to reduce its size as much as possible. The Cavity Filter is obviously a big factor in the MSA's size. I decided to try and duplicate the Cavity Filter's function utilizing a SAW based design. I found a source for a SAW from a company in England (Gooledge) that looked like it would be perfect for the job. I put together a design and PCB layout and approached Scotty with the idea. Scotty altered my design and layouts, and we iterated the design through a couple of cycles. The resulting performance we obtained turned out to be excellent.
>
> I created a file folder called "1013 MHz SAW Filter"
>
> http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/
>
> on the group page for you all to look at. The folder contains various frequency responses, pictures of the PCB, and construction stage photos. I also included a data sheet for the SAW that was used. Basically, the design consists of three cascaded SAWs, a few PADs and an ERA-33 amplifier. If you look at the group file, you will get a good idea of the approach and performance.
>
> I am curious if there would be any interest out there for putting together some sort of group buy for this filter. A group buy would be for the SAWs (three required/filter-I paid $5.75/each ordering in small quantity), a PCB (>$5.00/each), plus shipping. The quantity we order will obviously drive the SAW cost. The rest of the parts needed to complete the

assembly (caps, resistors, connectors,etc.) are very similar to the MSA's current IF ERA-33SM based amplifier. If there is enough interest, I would be willing to facilitate the group buy of the SAWs and PCBs.
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> Before we formally begin a group buy, those of you out there with interest please post a response so we can get an idea of what quantities we may be talking about. BTW, Scotty is considering adding this to the formal SLIM list. He is working on putting the PCB layout, schematic and parts lists in the form consistent with what he uses for SLIMs.
>
> Neal
>

8816. Re: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 04:11:51 UTC
From: Phil Sittner
Topic: 8774 Message: 8816

Mark-

I'm just beginning the SLIM build and would like to be included in the group buy. Just let me know where the money is to be sent, and thanks for your efforts in developing this option.

Phil
kd6rm
----- Original Message -----
From: Mark Burgin
To: spectrumanalyzer@yahoogroups.com
Sent: Tuesday, December 06, 2011 3:43 PM
Subject: RE: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

I would be interested in two sets.

Thanks

Mark

From: spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] On Behalf Of nealmartini
Sent: 06 December 2011 04:27
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

All,

Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").

A few months ago I started looking at building another MSA and wanted to reduce its size as much as possible. The Cavity Filter is obviously a big factor in the MSA's size. I decided to try and duplicate the Cavity Filter's function utilizing a SAW based design. I found a source for a SAW from a company in England (Gooledge) that looked like it would be perfect for the jo! b. I put together a design and PCB layout and approached Scotty with the idea. Scotty altered my design and layouts, and we iterated the design through a couple of cycles. The resulting performance we obtained turned out to be excellent.

I created a file folder called "1013 MHz SAW Filter"

http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/

on the group page for you all to look at. The folder contains various frequency responses, pictures of the PCB, and construction stage photos. I also included a data sheet for the SAW that was used. Basically, the design consists of three cascaded SAWs, a few PADs and an ERA-33 amplifier. If you look at the group file, you will get a good idea of the approach and performance.

I am curious if there would be any interest out there for putting together some sort of group buy for this filter. A group buy would be for the SAWs (three required/filter-I paid $5.75/each ordering in small quantity), a PCB (>$5.00/each), plus shipping. The quantity we order will obviously drive the SAW cost. The rest of the parts needed to complete the assembly (caps, resistors, connectors,etc.) are very similar to the MSA's current IF ERA-33SM based amplifier. If there is enough interest, I would be willing to facilitate the group buy of the SAWs and PCBs.

Before we formally begin a group buy, those of you out there with interest please post a response so we can get an idea of what quantities we may be talking about. BTW, Scotty is considering adding this to the formal SLIM list. He is working on putting the PCB layout, schematic and parts lists in the form consistent with what he uses for SLIMs.

Neal

8817. Re: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 04:21:16 UTC
From: Phil Sittner
Topic: 8774 Message: 8817

Neal-

I responded to the wrong email-Please put me down for a set and thanks for your efforts.

Phil
kd6rm
----- Original Message -----
From: nealmartini
To: spectrumanalyzer@yahoogroups.com
Sent: Monday, December 05, 2011 8:27 PM
Subject: [spectrumanalyzer] 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

All,

Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").

A few months ago I started looking at building another MSA and wanted to reduce its size as much as possible. The Cavity Filter is obviously a big factor in the MSA's size. I decided to try and duplicate the Cavity Filter's function utilizing a SAW based design. I found a source for a SAW from a company in England (Gooledge) that looked like it would be perfect for the job. I put together a design and PCB layout and approached Scotty with the idea. Scotty altered my design and layouts, and we iterated the design through a couple of cycles. The resulting performance we obtained turned out to be excellent.

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Before we formally begin a group buy, those of you out there with interest please post a response so we can get an idea of what quantities we may be talking about. BTW, Scotty is considering adding this to the formal SLIM list. He is working on putting the PCB layout, schematic and parts lists in the form consistent with what he uses for SLIMs.

Neal

8818. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 04:59:44 UTC
From: recurve35m
Topic: 8774 Message: 8818

Neil,
Put me on your list for 2 sets.
Thanks
Shawn Gibson

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> All,
>
> Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").
>
> A few months ago I started looking at building another MSA and wanted to reduce its size as much as possible. The Cavity Filter is obviously a big factor in the MSA's size. I decided to try and duplicate the Cavity Filter's function utilizing a SAW based design. I found a source for a SAW from a company in England (Gooledge) that looked like it would be perfect for the job. I put together a design and PCB layout and approached Scotty with the idea. Scotty altered my design and layouts, and we iterated the design through a couple of cycles. The resulting performance we obtained turned out to be excellent.
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> http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/
>
> on the group page for you all to look at. The folder contains various frequency responses, pictures of the PCB, and construction stage photos. I also included a data sheet for the SAW that was used. Basically, the design consists of three cascaded SAWs, a few PADs and an ERA-33 amplifier. If you look at the group file, you will get a good idea of the approach and performance.
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> I am curious if there would be any interest out there for putting together some sort of group buy for this filter. A group buy would be for the SAWs (three required/filter-I paid $5.75/each ordering in small quantity), a PCB (>$5.00/each), plus shipping. The quantity we order will obviously drive the SAW cost. The rest of the parts needed to complete the assembly (caps, resistors, connectors,etc.) are very similar to the MSA's current IF ERA-33SM based amplifier. If there is enough interest, I would be willing to facilitate the group buy of the SAWs and PCBs.
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schematic and parts lists in the form consistent with what he uses for SLIMs.
>
> Neal
>

8819. Hot Air Soldering

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 06:15:07 UTC
From: peepholenz
Topic: 8819 Message: 8819

This might be of interest for 3x3mm filters etc
Hot air soldering station for about $65US.

<http://www.ebay.com/itm/ATTEN-858D-SMD-Hot-Air-Rework-Station-Solder-858D-/110726694669?pt=LH_DefaultDomain_0&hash=item19c7d3470d>.

Same item also appears elsewhere on ebay.

I received mine a couple of weeks ago and have found it very easy to use - only on some old cellphone boards as a trial.
No idea how long it'll last....but at the price.....

Make sure you get one with the correct voltage though - mine needs 230v as the southern hemisphere electrons are only half the size of the US ones.
It arrived quite quickly,about 10days. It is small enough to easily fit on my rather messy workbench.

Peter
ZL2AYX

8820. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 07:39:30 UTC
From: loic
Topic: 8774 Message: 8820

Hi
Good news,

So you can count on me for one

regards
Loïc

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> All,
>
> Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").
>
> A few months ago I started looking at building another MSA and wanted to reduce its size as much as possible. The Cavity Filter is obviously a big factor in the MSA's size. I decided to try and duplicate the Cavity Filter's function utilizing a SAW based design. I found a source for a SAW from a company in England (Gooledge) that looked like it would be perfect for the job. I put together a design and PCB layout and approached Scotty with the idea. Scotty altered my design and layouts, and we iterated the design through a couple of cycles. The resulting performance we obtained turned out to be excellent.
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>
> http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/
>
> on the group page for you all to look at. The folder contains various frequency responses, pictures of the PCB, and construction stage photos. I also included a data sheet for the SAW that was used. Basically, the design consists of three cascaded SAWs, a few PADs and an ERA-33 amplifier. If you look at the group file, you will get a good idea of the approach and performance.
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> I am curious if there would be any interest out there for putting together some sort of group buy for this filter. A group buy would be for the SAWs (three required/filter-I paid $5.75/each ordering in small quantity), a PCB (>$5.00/each), plus shipping. The quantity we order will obviously drive the SAW cost. The rest of the parts needed to complete the assembly (caps, resistors, connectors,etc.) are very similar to the MSA's current IF ERA-33SM based amplifier. If there is enough interest, I would be willing to facilitate the group buy of the SAWs and PCBs.
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> Before we formally begin a group buy, those of you out there with interest please post a

response so we can get an idea of what quantities we may be talking about. BTW, Scotty is considering adding this to the formal SLIM list. He is working on putting the PCB layout, schematic and parts lists in the form consistent with what he uses for SLIMs.
>
> Neal
>

8821. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 10:27:13 UTC
From: lh1907
Topic: 8774 Message: 8821

Neal,
Add me to your list for one 1013 MHz filter. Thanks.
Larry, W2HHV

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> All,
>
> I created a file folder called "1013 MHz SAW Filter"
>
> http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/
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> Before we formally begin a group buy, those of you out there with interest please post a response so we can get an idea of what quantities we may be talking about. BTW, Scotty is considering adding this to the formal SLIM list. He is working on putting the PCB layout, schematic and parts lists in the form consistent with what he uses for SLIMs.
>
> Neal
>

8822. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 11:00:35 UTC
From: Gordon Russell
Topic: 8774 Message: 8822

Neal

Please add me to the list for 1 set.

Thanks, Gordon G6GMH

8823. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 11:07:55 UTC
From: s.staines@cranfield.ac.uk
Topic: 8774 Message: 8823

Hi Neal
Please could you put me down of one saw filter set.
Great work, well done.

Steve g7was

8824. Re: [spectrumanalyzer] Hot Air Soldering

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 11:14:58 UTC
From: Jim Hontoria
Topic: 8819 Message: 8824

Looks interesting but here is how I did it and had fun doing so:

1. Got at Home Depot a small Wagner HT400 Heat Gun.
2. I got and Arduino PID controller (which does double duty at my toaster reflow oven) and rewired the Wagner's heating element.
3. I build my nozzles with light weight aluminum flashing (also from the Home Depot) and hold them with a small SS clamp.

BTW the Wagner gun is powerfull enough to heat up the back of a circuit board and easily recycle its components.

Jim, W1JGH

On Wed, Dec 7, 2011 at 1:15 AM, peepholenz <p.pohl@...> wrote:

> **
>
>
> This might be of interest for 3x3mm filters etc
> Hot air soldering station for about $65US.
>
> <
> http://www.ebay.com/itm/ATTEN-858D-SMD-Hot-Air-Rework-Station-Solder-858D-/110726694669?pt=LH_DefaultDomain_0&hash=item19c7d3470d
> >.
>
> Same item also appears elsewhere on ebay.
>
> I received mine a couple of weeks ago and have found it very easy to use -
> only on some old cellphone boards as a trial.
> No idea how long it'll last....but at the price.....
>
> Make sure you get one with the correct voltage though - mine needs 230v as
> the southern hemisphere electrons are only half the size of the US ones.
> It arrived quite quickly,about 10days. It is small enough to easily fit on
> my rather messy workbench.
>
> Peter
> ZL2AYX
>
>
>

--
Jim G. Hontoria

8825. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 11:25:30 UTC
From: rjacksonzener
Topic: 8774 Message: 8825

Neal,

Please put me down for two sets.

Ron
VK2ZPJ

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> All,
>
> Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").
>

8826. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 11:43:04 UTC
From: enz.lim
Topic: 8774 Message: 8826

Hi Neal,

i would also like to sign for two sets.

Best regards,
Martin

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> All,
>
> Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").
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> http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/
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considering adding this to the formal SLIM list. He is working on putting the PCB layout, schematic and parts lists in the form consistent with what he uses for SLIMs.
>
> Neal
>

8827. Re: Hot Air Soldering

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 13:13:52 UTC
From: John Faughn
Topic: 8819 Message: 8827

Every time I have bought chieeze stuff , I have regretted it .
Many times it just doesn't do the job , almost all the time , several
things go wrong early .
Making me tell myself never again .
There is a saying about quality tools ,
BITCH ONCE WHEN YOU BUY IT - higher price .
NOT EVERY TIME YOU USED IT - cheap chineeze junk .
In the long run you do a better job for less time and money , doing a bad
job , redoing that job and buying another tool every time it breaks .
That's aside from , talking work away from local manufacturing .
John
KD0CAC
73

8828. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 13:20:21 UTC
From: loic
Topic: 8774 Message: 8828

Adendum
Two pieces

regards
Loïc

--- In spectrumanalyzer@yahoogroups.com, "loic" <f6deb@...> wrote:
>
> Hi
> Good news,
>
> So you can count on me for one
>
> regards
> Loïc
>
>
> --- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@> wrote:
> >
> > All,
> >
> > Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").
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> >
> > Neal
> >
>

8829. Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 14:16:42 UTC
From: David McGough
Topic: 8774 Message: 8829

Neal,

Please add my name to the list for 2 SAW filter boards & parts, too.

73, David KB4FXC

> > --- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@> wrote:
> > >
> > > All,
> > >
> > > Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").
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> > >
> > > Neal
> > >
> >
>
>
>

8830. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 14:59:51 UTC
From: george quarterman
Topic: 8774 Message: 8830

Hi Neal,

2 OFF Please, or 2 kits whichever you decide to do.

Thanks for your efforts.

73 to all,
George,G3NHX.

8831. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 16:39:41 UTC
From: ed_k7ock
Topic: 8774 Message: 8831

Please put me down for 2 filters.

Thanks,

Ed K7OCK

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> All,
>
> Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").
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schematic and parts lists in the form consistent with what he uses for SLIMs.
>
> Neal
>

8832. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 21:00:06 UTC
From: Gerard Sexton
Topic: 8774 Message: 8832

Hi Neal.

I would also like to participate in the group buy - the results look excellent!

Regards

Gerard (vk3cg/vk3grs)

8833. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-07 22:14:51 UTC
From: vk7zcp
Topic: 8774 Message: 8833

Hi Neal

I would be interested in buying 4 filter sets.

Cheers,
Colin VK7ZCP

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> All,
>
> Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").
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>
> Neal
>

8834. Multiple saw filters?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-08 15:12:35 UTC
From: mdgolfbum
Topic: 8834 Message: 8834

Is there a reason to buy more than one kit if I only have a single MSA? Are the SAW filter kits useful in more than one place like a tracking generator or some other aspect of measurement when using the MSA?

My MSA kit is in the basement and not yet started.

Thanks

Jim ab3cv

8835. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-08 15:18:49 UTC
From: Dale
Topic: 8774 Message: 8835

Neil,

Put me down for two also.

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> All,
>
> Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").
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>
> Neal
>

8836. Re: Multiple saw filters?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-08 15:48:57 UTC
From: Sam
Topic: 8834 Message: 8836

One filter is all you need, to replace the cavity filter. I assume people ordering multiple kits have non-MSA uses in mind.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "mdgolfbum" <jim@...> wrote:
>
> Is there a reason to buy more than one kit if I only have a single MSA? Are the SAW filter kits useful in more than one place like a tracking generator or some other aspect of measurement when using the MSA?
>
> My MSA kit is in the basement and not yet started.
>
> Thanks
>
> Jim ab3cv
>

8837. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-08 16:17:12 UTC
From: hdbok
Topic: 8774 Message: 8837

Neal,

This looks great! Please put me down for two sets.

Many thanks.

Hans, PA1HDB

8838. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-08 22:18:12 UTC
From: inlinebeginner
Topic: 8774 Message: 8838

Neil,
Good job. I am interested in two sets.
A good discovery, makes the cavity filter eaiser. I remember the discussion a while ago. With the amplfier, although the insertion loss can be 0, but the noise figure might be around 7 to 8 dB, similar to the original cavity filter. Therefore, the overall noise floor of MSA will be similar to the one with cavity filter. The difference is the rejection, cavity filter has better rejection at 1034MHz (around 105dB or higher). I don't think we care about the difference between 95dB and 105dB. The small size is the real reason that I want to try this filter.
Thanks
Lin

> --- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@> wrote:
> >
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> >
> > Neal
> >
>

8839. 1 GHz low pass filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-08 23:25:48 UTC
From: undercoupled
Topic: 8839 Message: 8839

If anyone is interested, one of my favorite Ebay sellers has M/A COM 1 GHz low pass filters cheap, SO8 package. Maybe clean up harmonic feedthru on the first conversion filter. Item # 400094925860

Jerry

8840. Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 10:04:46 UTC
From: Weddig, Henning-Christof
Topic: 8774 Message: 8840

having looked on the "original" manufacturers site Tai SAW is the manufacturer, golledge is "only" a disitributor.

What concerns me a bit: due to the very tiny structures on the SAW these filters can not withstand input powers above about 0 dBm. filters.

Overdriving these filters will cause a "slow" degaradation

Unfortunately there is no ifnormation on the data sheet about the maximum drive capability...

Henning Weddig

Am 08.12.2011 23:18, schrieb inlinebeginner:
> Neil,
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> Thanks
> Lin
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> > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "nealmartini"
> <nealmartini@> wrote:
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> > > Neal
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> >
>
>

8841. Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 13:23:02 UTC
From: SFC
Topic: 8774 Message: 8841

Acc the datasheet: max . power 10dbm.
Or are they very optimistic?

Simon

----- Original Message -----
From: "Weddig, Henning-Christof" <Henning-Christof.Weddig@...>
To: <spectrumanalyzer@yahoogroups.com>
Sent: Friday, December 09, 2011 11:04 AM
Subject: Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

> having looked on the "original" manufacturers site Tai SAW is the
> manufacturer, golledge is "only" a disitributor.
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> What concerns me a bit: due to the very tiny structures on the SAW these
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>
> Henning Weddig
>
>
> Am 08.12.2011 23:18, schrieb inlinebeginner:
>> Neil,
>> Good job. I am interested in two sets.
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>> discussion a while ago.
>> With the amplfier, although the insertion loss can be 0, but the noise
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>> > --- In spectrumanalyzer@yahoogroups.com
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>> > > Neal
>> > >
>> >
>>
>>
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> ----------
>
> Yahoo! Groups Links
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8842. Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 14:06:52 UTC
From: william sprowls
Topic: 8774 Message: 8842

Hi Henning and All,
A 0 dBm maximum input to the SAW device is probably a good guess. This new assembly will have a 3 dB attenuator preceding the SAW. In the MSA, the assembly follows Mixer 1 (replacing the Cavity Filter). With this configuration, the maximum input to the MSA (for compression) is about -17 dBm. This means the maximum input to the SAW (during normal use) will be about -25.5 dBm
During MSA calibration, a maximum input could be +10 dBm. This means the input to the SAW will be about +.5 dBm.
So, there is no problem when used in the MSA. If it is used for some other project, a maximum input to the assembly should be specified as +3 dBm.
Scotty

--- On Fri, 12/9/11, Weddig, Henning-Christof <Henning-Christof.Weddig@...> wrote:

> From: Weddig, Henning-Christof <Henning-Christof.Weddig@...>
> Subject: Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, December 9, 2011, 4:04 AM
> having looked on the "original"
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> > Lin
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> > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>,
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> > <nealmartini@> wrote:
> > > >
> > > > All,
> > > >
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> Yahoo! Groups Links
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> spectrumanalyzer-fullfeatured@yahoogroups.com
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8843. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 14:16:22 UTC
From: Sam
Topic: 8774 Message: 8843

The insertion loss of Mixer 1 is about 6 dB for the actual mixer plus 3 dB for the input attenuator. And once you get to high level signals (approx. 0 dBm) you get about 0.5 dB additional output for 1 dB of additional input, so even with a ridiculously high input level such as 10 dBm I don't think you would get even 0 dBm out of Mixer 1 running to the SAW filter. I haven't seen the schematic, so I'm not sure how the internal amp in the filter fits into this analysis.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "SFC" <sf-cillari@...> wrote:
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> Acc the datasheet: max . power 10dbm.
> Or are they very optimistic?
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> Simon
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> ----- Original Message -----
> From: "Weddig, Henning-Christof" <Henning-Christof.Weddig@...>
> To: <spectrumanalyzer@yahoogroups.com>
> Sent: Friday, December 09, 2011 11:04 AM
> Subject: Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the
> MSA Cavity Filter
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> > having looked on the "original" manufacturers site Tai SAW is the
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> > Am 08.12.2011 23:18, schrieb inlinebeginner:
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> >> Good job. I am interested in two sets.
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8844. Coax Filter build and 1013 MHz SAW Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 14:39:08 UTC
From: marc olanié
Topic: 8844 Message: 8844

>I have received orders for 13 coax filter units. Now this SAW filter turns up out of the blue.

>Some coax buyers may be in a conundrum.

That☐s quite an understatement :-)

Dear Len

I must admit that I☐m a little bit puzzled. The price difference is important and the performances are almost the same. But the cavity filter is definitely more robust.

Anyway, I gave you my word, and I☐m still interested having a ☐full metal cavity☐

But if I☐m the only guy in town on the waiting list, I don☐t think it will worth the hassle. It will cost you time, energy, and I think the SAW filter will be ok form my MSA

So, I☐ll let you decide.

And please, don☐t hesitate if you decide to make a run of filter and if you need a Paypal order, I☐ll sent it to you a.s.a.p.

Cheers

Marc

8845. Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 14:50:57 UTC
From: william sprowls
Topic: 8774 Message: 8845

Simon,
Yes the data sheet says max input is +10 dBm and it also says +5vdc. However, this is "maximum without destruction". They don't specify "maximum without changes to operating characteristics". Our (engineering) rule of thumb....don't operate a SAW device with a DC bias voltage on its input or output, and always keep the power well below maximums (at least 3 dB).
Scotty

--- On Fri, 12/9/11, SFC <sf-cillari@...> wrote:

> From: SFC <sf-cillari@...>
> Subject: Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, December 9, 2011, 7:23 AM
> Acc the datasheet: max . power
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> Or are they very optimistic?
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> Simon
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> ----- Original Message -----
> From: "Weddig, Henning-Christof" <Henning-Christof.Weddig@...>
> To: <spectrumanalyzer@yahoogroups.com>
> Sent: Friday, December 09, 2011 11:04 AM
> Subject: Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter
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8846. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 16:31:04 UTC
From: nealmartini
Topic: 8774 Message: 8846

Sam,

There is a rough (unlabled stuff) schematic in the file folder. Scotty is working on a "SLIM" version.

Neal

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> The insertion loss of Mixer 1 is about 6 dB for the actual mixer plus 3 dB for the input attenuator. And once you get to high level signals (approx. 0 dBm) you get about 0.5 dB additional output for 1 dB of additional input, so even with a ridiculously high input level such as 10 dBm I don't think you would get even 0 dBm out of Mixer 1 running to the SAW filter. I haven't seen the schematic, so I'm not sure how the internal amp in the filter fits into this analysis.
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> > ----- Original Message -----
> > From: "Weddig, Henning-Christof" <Henning-Christof.Weddig@>
> > To: <spectrumanalyzer@yahoogroups.com>
> > Sent: Friday, December 09, 2011 11:04 AM
> > Subject: Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the
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8847. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 17:23:59 UTC
From: Sam
Topic: 8774 Message: 8847

OK, I missed that. The arrangement is Input-Pad-SAW-Amp-SAW-Pad-Amp-Pad-Output, with 3 dB of loss in each pad and SAW and max gain in the Amp of perhaps 20 dB. This means the SAW after the Amp gets the strongest signal, which would be 14 dB above the filter module input. Using a crazy input of 10 dBm, which would create total loss in the Mixer 1 module of about 14 dB, this means a 10 dBm input could conceivably hit the max power level for that particular SAW.

I haven't tested the mixer module above inputs of 7 dBm, but it may be that by the time you hit 10 dBm the mixer output no longer increases much as the input increases, so maybe the mixer will act as a protective limiter.

While an input of 10 dBm would probably display as a mess of distortion on the MSA, it is conceivable that such an input could occur. Maybe an optional pad at the Amp output would be a good idea. I allowed for 20 dB of amp gain above; if it is only the more common 17-18 dB, the pad could be omitted but if it is the possible-but-not-likely 20-21 dB, the pad could be added.

Certainly at normal levels of use, which would not exceed 0 dBm at the MSA input, the SAWs will not be exposed to excess power.

I'm also curious why the overall filter ends up with a 3 dB bandwidth of about 14 MHz, when the spec for an individual filter is 1 MHz. Not that this is a problem, because the skirts are so steep, but it is curious. (I also just noted that the graph for a single SAW+Amp has a bandwidth of about 20 MHz--maybe the spec is a typo.)

Sam W.

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> > > >> filter that can be used in place of the Cavity Filter that is currently
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> > > >> dB of rejection at the MSA second mixer's image frequency (around 1034
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> > > >> Basically, the design consists of three cascaded SAWs, a few PADs and an
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8848. Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 18:07:44 UTC
From: william sprowls
Topic: 8774 Message: 8848

Hi Sam,
 The data sheet specification for the BW is likely a "finger blunder" when it was released. They missed a digit. It should be 18 MHz, not 1 MHz. Even their swept data shows it to be about 18 MHz bandwidth (3 dB)
Scotty

--- On Fri, 12/9/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
To: spectrumanalyzer@yahoogroups.com
Date: Friday, December 9, 2011, 11:23 AM

OK, I missed that. The arrangement is Input-Pad-SAW-Amp-SAW-Pad-Amp-Pad-Output, with 3 dB of loss in each pad and SAW and max gain in the Amp of perhaps 20 dB. This means the SAW after the Amp gets the strongest signal, which would be 14 dB above the filter module input. Using a crazy input of 10 dBm, which would create total loss in the Mixer 1 module of about 14 dB, this means a 10 dBm input could conceivably hit the max power level for that particular SAW.

I haven't tested the mixer module above inputs of 7 dBm, but it may be that by the time you hit 10 dBm the mixer output no longer increases much as the input increases, so maybe the mixer will act as a protective limiter.

While an input of 10 dBm would probably display as a mess of distortion on the MSA, it is conceivable that such an input could occur. Maybe an optional pad at the Amp output would be a good idea. I allowed for 20 dB of amp gain above; if it is only the more common 17-18 dB, the pad could be omitted but if it is the possible-but-not-likely 20-21 dB, the pad could be added.

Certainly at normal levels of use, which would not exceed 0 dBm at the MSA input, the SAWs will not be exposed to excess power.

I'm also curious why the overall filter ends up with a 3 dB bandwidth of about 14 MHz, when the spec for an individual filter is 1 MHz. Not that this is a problem, because the skirts are so steep, but it is curious. (I also just noted that the graph for a single SAW+Amp has a bandwidth of about 20 MHz--maybe the spec is a typo.)

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:

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> Sam,

>

> There is a rough (unlabled stuff) schematic in the file folder. Scotty is working on a "SLIM" version.

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> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:

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> > --- In spectrumanalyzer@yahoogroups.com, "SFC" <sf-cillari@> wrote:

> > >

> > > Acc the datasheet: max . power 10dbm.

> > > Or are they very optimistic?

> > >

> > > Simon

> > >

> > >

> > > ----- Original Message -----

> > > From: "Weddig, Henning-Christof" <Henning-Christof.Weddig@>

> > > To: <spectrumanalyzer@yahoogroups.com>

> > > Sent: Friday, December 09, 2011 11:04 AM

> > > Subject: Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the

> > > MSA Cavity Filter

> > >

> > >

> > > > having looked on the "original" manufacturers site Tai SAW is the

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> > > > What concerns me a bit: due to the very tiny structures on the SAW these

> > > > filters can not withstand input powers above about 0 dBm. filters.

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> > > > Overdriving these filters will cause a "slow" degaradation

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> > > > Unfortunately there is no ifnormation on the data sheet about the

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> > > > Henning Weddig

> > > >

> > > >

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> > > >> A good discovery, makes the cavity filter eaiser. I remember the

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> > > >> With the amplfier, although the insertion loss can be 0, but the noise

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> > > >> better rejection at 1034MHz (around 105dB or higher). I don't think we

> > > >> care about the difference between 95dB and 105dB. The small size is the

> > > >> real reason that I want to try this filter.

> > > >> Thanks

> > > >> Lin

> > > >>

> > > >> > --- In spectrumanalyzer@yahoogroups.com

> > > >> <mailto:spectrumanalyzer%40yahoogroups.com>, "nealmartini"

> > > >> <nealmartini@> wrote:

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> > > > Yahoo! Groups Links

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8849. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 18:45:13 UTC
From: jamesgailer
Topic: 8774 Message: 8849

Neal

Please add me to the list for 2 sets.

Thanks, Jim, G3RTD

8851. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 20:00:54 UTC
From: Sam
Topic: 8774 Message: 8851

18 MHz makes a lot more sense. 1 MHz wasn't very credible.

Also, I described the arrangement as though there are two amps. Actual arrangement is:
Input-Pad-SAW-Amp-SAW-Pad-SAW-Pad-Output

Sam W.

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> --- On Fri, 12/9/11, Sam <swetterlin@...> wrote:
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> Subject: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
> To: spectrumanalyzer@yahoogroups.com
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> > > > ----- Original Message -----
>
> > > > From: "Weddig, Henning-Christof" <Henning-Christof.Weddig@>
>
> > > > To: <spectrumanalyzer@yahoogroups.com>
>
> > > > Sent: Friday, December 09, 2011 11:04 AM
>

> > > > Subject: Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the
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8852. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 20:26:07 UTC
From: nealmartini
Topic: 8774 Message: 8852

Sam,

I did not spend a lot of time characterizing it yet, but The overall response actually looks very good when I put the Dual SAW module in front of the the AMP SAW module. I thought that might be pertinent to the discussion your having.

Neal

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
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> 18 MHz makes a lot more sense. 1 MHz wasn't very credible.
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> Also, I described the arrangement as though there are two amps. Actual arrangement is:
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> > >
> >
> > > There is a rough (unlabled stuff) schematic in the file folder. Scotty is working on a "SLIM" version.
> >
> > >
> >
> > > Neal
> >
> > >
> >
> > >
> >
> > >
> >
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > > >
> >
> > > > The insertion loss of Mixer 1 is about 6 dB for the actual mixer plus 3 dB for the input attenuator. And once you get to high level signals (approx. 0 dBm) you get about 0.5 dB additional output for 1 dB of additional input, so even with a ridiculously high input level such as 10 dBm I don't think you would get even 0 dBm out of Mixer 1 running to the SAW filter. I haven't seen the schematic, so I'm not sure how the internal amp in the filter fits into this analysis.
> >
> > > > Sam W.
> >
> > > >
> >
> > > > --- In spectrumanalyzer@yahoogroups.com, "SFC" <sf-cillari@> wrote:
> >
> > > > >
> >
> > > > > Acc the datasheet: max . power 10dbm.
> >
> > > > > Or are they very optimistic?
> >
> > > > >
> >
> > > > > Simon
> >
> > > > >

> >
> > > > >
> >
> > > > > ----- Original Message -----
> >
> > > > > From: "Weddig, Henning-Christof" <Henning-Christof.Weddig@>
> >
> > > > > To: <spectrumanalyzer@yahoogroups.com>
> >
> > > > > Sent: Friday, December 09, 2011 11:04 AM
> >
> > > > > Subject: Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the
> >
> > > > > MSA Cavity Filter
> >
> > > > >
> >
> > > > >
> >
> > > > > > having looked on the "original" manufacturers site Tai SAW is the
> >
> > > > > > manufacturer, golledge is "only" a disitributor.
> >
> > > > > >
> >
> > > > > > What concerns me a bit: due to the very tiny structures on the SAW these
> >
> > > > > > filters can not withstand input powers above about 0 dBm. filters.
> >
> > > > > >
> >
> > > > > > Overdriving these filters will cause a "slow" degaradation
> >
> > > > > >
> >
> > > > > > Unfortunately there is no ifnormation on the data sheet about the
> >
> > > > > > maximum drive capability...
> >
> > > > > >
> >
> > > > > > Henning Weddig
> >
> > > > > >
> >
> > > > > >
> >
> > > > > > Am 08.12.2011 23:18, schrieb inlinebeginner:
> >
> > > > > >> Neil,

> >
> > > > > >> Good job. I am interested in two sets.
> >
> > > > > >> A good discovery, makes the cavity filter eaiser. I remember the
> >
> > > > > >> discussion a while ago.
> >
> > > > > >> With the amplfier, although the insertion loss can be 0, but the noise
> >
> > > > > >> figure might be around 7 to 8 dB, similar to the original cavity filter.
> >
> > > > > >> Therefore, the overall noise floor of MSA will be similar to the one
> >
> > > > > >> with cavity filter. The difference is the rejection, cavity filter has
> >
> > > > > >> better rejection at 1034MHz (around 105dB or higher). I don't think we
> >
> > > > > >> care about the difference between 95dB and 105dB. The small size is the
> >
> > > > > >> real reason that I want to try this filter.
> >
> > > > > >> Thanks
> >
> > > > > >> Lin
> >
> > > > > >>
> >
> > > > > >> > --- In spectrumanalyzer@yahoogroups.com
> >
> > > > > >> <mailto:spectrumanalyzer%40yahoogroups.com>, "nealmartini"
> >
> > > > > >> <nealmartini@> wrote:
> >
> > > > > >> > >
> >
> > > > > >> > > All,
> >
> > > > > >> > >
> >
> > > > > >> > > Let me start out with the bottom line. With a lot of help from
> >
> > > > > >> Scotty, I put together a working prototype of a 1013 MHz SAW based
> >
> > > > > >> filter that can be used in place of the Cavity Filter that is currently
> >
> > > > > >> in the MSA. The resulting filter has 100 dB of ultimate rejection, >90
> >
> > > > > >> dB of rejection at the MSA second mixer's image frequency (around 1034
> >
> > > > > >> MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB

> >
> > > > > >> footprint is equivalent to one SLIM size board (1.2" x 1.2").
> >
> > > > > >> > >
> >
> > > > > >> > > A few months ago I started looking at building another MSA and
> >
> > > > > >> wanted to reduce its size as much as possible. The Cavity Filter is
> >
> > > > > >> obviously a big factor in the MSA's size. I decided to try and duplicate
> >
> > > > > >> the Cavity Filter's function utilizing a SAW based design. I found a
> >
> > > > > >> source for a SAW from a company in England (Gooledge) that looked like
> >
> > > > > >> it would be perfect for the job. I put together a design and PCB layout
> >
> > > > > >> and approached Scotty with the idea. Scotty altered my design and
> >
> > > > > >> layouts, and we iterated the design through a couple of cycles. The
> >
> > > > > >> resulting performance we obtained turned out to be excellent.
> >
> > > > > >> > >
> >
> > > > > >> > > I created a file folder called "1013 MHz SAW Filter"
> >
> > > > > >> > >
> >
> > > > > >> > >
> >
> > > > > >>
http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/
> >
> > > > > >>
> >
> > > > > >> > >
> >
> > > > > >> > > on the group page for you all to look at. The folder contains
> >
> > > > > >> various frequency responses, pictures of the PCB, and construction stage
> >
> > > > > >> photos. I also included a data sheet for the SAW that was used.
> >
> > > > > >> Basically, the design consists of three cascaded SAWs, a few PADs and an
> >
> > > > > >> ERA-33 amplifier. If you look at the group file, you will get a good
> >
> > > > > >> idea of the approach and performance.
> >

> > > > > >> > >
> >
> > > > > >> > > I am curious if there would be any interest out there for putting
> >
> > > > > >> together some sort of group buy for this filter. A group buy would be
> >
> > > > > >> for the SAWs (three required/filter-I paid $5.75/each ordering in small
> >
> > > > > >> quantity), a PCB (>$5.00/each), plus shipping. The quantity we order
> >
> > > > > >> will obviously drive the SAW cost. The rest of the parts needed to
> >
> > > > > >> complete the assembly (caps, resistors, connectors,etc.) are very
> >
> > > > > >> similar to the MSA's current IF ERA-33SM based amplifier. If there is
> >
> > > > > >> enough interest, I would be willing to facilitate the group buy of the
> >
> > > > > >> SAWs and PCBs.
> >
> > > > > >> > >
> >
> > > > > >> > > Before we formally begin a group buy, those of you out there with
> >
> > > > > >> interest please post a response so we can get an idea of what quantities
> >
> > > > > >> we may be talking about. BTW, Scotty is considering adding this to the
> >
> > > > > >> formal SLIM list. He is working on putting the PCB layout, schematic and
> >
> > > > > >> parts lists in the form consistent with what he uses for SLIMs.
> >
> > > > > >> > >
> >
> > > > > >> > > Neal
> >
> > > > > >> > >
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8853. Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 21:27:32 UTC
From: Geoff Moore
Topic: 8774 Message: 8853

Looking at the schematic in the files section, could the input from mixer1 be connected to J3, J4 connected to J1 and the output taken from J2. The pad preceding J4 could be bypassed and the pad following J1 increased to 6dB.

Same overall gain but lower input to SAW's. Only snag may be lack of pad to improve Z match from mixer to SAW.

My coax filter is no work of art but it works OK, the extra space gained by the new filter would allow for extra goodies.

Geoff

----- Original Message -----
From: "nealmartini" <nealmartini@...>
To: <spectrumanalyzer@yahoogroups.com>
Sent: Friday, December 09, 2011 8:26 PM
Subject: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Sam,

I did not spend a lot of time characterizing it yet, but The overall response actually looks very good when I put the Dual SAW module in front of the the AMP SAW module. I thought that might be pertinent to the discussion your having.

Neal

8854. Re: [spectrumanalyzer] Re: SLIM PDM with Rev 0 pwb

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 21:29:00 UTC
From: Steve
Topic: 8736 Message: 8854

Thanks for the clarification and advice.

Scotty -- another question. The Rev A schematic has R11, 10 ohms, at the 10VDC input to the PWB. The picture appears to have a ferrite at that location on the PWB, while the PWB layout has the component labelled as FB1 and R11 is not included on the Rev A parts list.

Is the schematic correct? If so, the picture, PWB layout and parts list are in error?

Advice?

Thanks.

Steve K8JQ

On 12/5/2011 9:30 PM, william sprowls wrote:
>
>
> Hi Steve,
> Sam is right, it really doesn't matter which scheme you use. By
> theory, powering the final stage of the PDM from the ADC module should
> give more accuracy to the MSA (Mod 4). However, powering the ADC from
> the PDM is an easier modification. I have done both and can see no
> difference in accuracy. I may just delete Mod 4 to simplify things.
> The "no mod" scheme is to power the PDM and ADC independently from
> the 10v on the Control Board. Here, I did see a significant
> difference, due to the modules having different temperature changes.
> The error over a large temperature change was a little over 1 degree
> in phase error.
> Scotty
>
> --- On *Mon, 12/5/11, Sam /<swetterlin@...>/* wrote:
>
>
> From: Sam <swetterlin@...>
> Subject: [spectrumanalyzer] Re: SLIM PDM with Rev 0 pwb
> To: spectrumanalyzer@yahoogroups.com
> Date: Monday, December 5, 2011, 7:24 PM
>
> The important thing is that both the output flip-flop of the PDM
> and ADC have the same power supply, so the max PDM output voltage
> matches what the ADC expects. As I recall, I ended up powering the
> two modules in the opposite way that Scotty did, but I think I had
> to cut a trace on one of the modules to avoid the two regulators
> directly battling.

> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> </mc/compose?to=spectrumanalyzer%40yahoogroups.com>, Steve
> <steve65@...> wrote:
> >
> > Thanks for the advice. And I've learned over the years to label
> everything!
> >
> > One more question if I may: The web page for the PDM, near the
> end, has
> > a section that begins "MOD 4: Allows the Phase Detector IC (U5)
> to be
> > powered by the SLIM-ADC module." The web page for the ADC, near the
> > beginning, has a section with whose opening sentence reads "This
> > optional modification allows the SLIM-ADC-16 to be powered
> directly by
> > the Phase Detector Module's regulated +5 volts." So it appears that
> > either module can power the other. Does it matter which powers
> which? Is
> > there a preference?
> >
> > Steve K8JQ
> >
> > On 12/4/2011 10:32 PM, william sprowls wrote:
> > >
> > >
> > > Hi Steve,
> > > Since your board is blank, I would build it up with the mods.
> rather
> > > than build a RevA and then modify it. It is easiest to slice
> those 4
> > > traces on an empty board. The SLIM-RevA (PWB-Rev0) with mods
> is just
> > > as accurate as RevC. There was no special name given to the
> RevA with
> > > mods, other than just to say "my RevA has all the mods". When you
> > > finish, I would mark the bottom of the pwb, "PDM-RevA",
> "modified",
> > > and the date you did it. Years from now you won't have to
> scratch your
> > > head or lift the lid to verify what it is.
> > > Scotty
> > >
> > > --- On *Sun, 12/4/11, Steve /<steve65@...>/* wrote:
> > >
> > >
> > > From: Steve <steve65@...>
> > > Subject: Re: [spectrumanalyzer] SLIM PDM with Rev 0 pwb
> > > To: spectrumanalyzer@yahoogroups.com

> </mc/compose?to=spectrumanalyzer%40yahoogroups.com>
> > > Date: Sunday, December 4, 2011, 8:49 PM
> > >
> > > Scotty,
> > >
> > > I continue to plod along on my second phase detector SLIM and
> would
> > > appreciate your advice to ensure I'm headed in the right
> > > direction. My
> > > goal is to have a PDM with the latest available modifications.
> > >
> > > Keeping in mind that I have a Rev 0 PWB, here's what I plan to do:
> > > 1. Construct a Rev A phase detector module based upon SLIM-PDM
> Rev A,
> > > SKSLIM-PDM Rev A, PWB-PDM Rev 0 and PLSLIM-PDM Rev A.
> > > 2. Implement the four MOD's detailed at the end of the current web
> > > page
> > > in the section entitled "Updated 10-21-08 Modification of the
> > > SLIM-PDM-revA".
> > >
> > > Do those steps sound right?
> > >
> > > Given that I have a "blank" PWB, is there merit in building
> the Rev A
> > > PDM and testing it in my working MSA prior to implementing the
> four
> > > MOD's? Or would it make for easier construction to incorporate the
> > > four
> > > MOD's into the first-pass build?
> > >
> > > Is there an "official" nomenclature for the Rev A PDM SLIM that
> > > has the
> > > four MOD's? Is there a rev level? Or is it just known as "Rev A
> > > with the
> > > four MOD's"? :-)
> > >
> > > Is the performance of the "Rev A with the four MOD's" equivalent
> > > to the
> > > Rev C PDM SLIM?
> > >
> > > Thanks.
> > >
> > > Steve K8JQ
> > >
> > > On 11/25/2011 10:12 AM, william sprowls wrote:
> > > >
> > > >
> > > > Hi Steve,
> > > > I updated the PDM web page:
> > > > http://scottyspectrumanalyzer.com/slim_PDM.html

> > > > It now links the archived documents for what you need. Be sure
> > > to do a
> > > > "refresh" in your browser to get the latest page.
> > > > Scotty
> > > >
> > > > --- On *Thu, 11/24/11, Steve /<steve65@...
> > > </mc/compose?to=steve65%40suddenlink.net>>/* wrote:
> > > >
> > > >
> > > > From: Steve <steve65@...
> > > </mc/compose?to=steve65%40suddenlink.net>>
> > > > Subject: [spectrumanalyzer] SLIM PDM with Rev 0 pwb
> > > > To: spectrumanalyzer@yahoogroups.com
> </mc/compose?to=spectrumanalyzer%40yahoogroups.com>
> > > </mc/compose?to=spectrumanalyzer%40yahoogroups.com>
> > > > Date: Thursday, November 24, 2011, 4:59 PM
> > > >
> > > > Scotty,
> > > >
> > > > The phase detector module I constructed a couple of years
> ago uses
> > > > a Rev
> > > > 0 PWB and does not have the improvements for phase resolution or
> > > > one-shot stability that were developed later.
> > > >
> > > > I have another phase detector Rev 0 PWB with which I'd like to
> > > > construct
> > > > a second phase detector module with the improved operation -- I
> > > think
> > > > that would make it a REV C SLIM. After I get the second one
> > > > working, I
> > > > plan to modify the first one for the same improvements.
> > > >
> > > > Sadly, I have lost the printed copies I had of the parts list,
> > > > schematic
> > > > and text description related to the Rev 0 PWB. Seems to me I
> need
> > > > those
> > > > as a starting point. Are those documents still available? If
> > > they are
> > > > out there on the web site, perhaps you could point me to them?
> > > >
> > > > Thanks.
> > > >
> > > > Steve K8JQ
>

8855. Re: [spectrumanalyzer] Hot Air Soldering

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 21:45:16 UTC
From: Geoff Moore
Topic: 8819 Message: 8855

If you already built the MSA phase detector, the filters are going to look massive. I hope I never have to work on that module again.

Geoff

----- Original Message -----
From: "peepholenz" <p.pohl@...>
To: <spectrumanalyzer@yahoogroups.com>
Sent: Wednesday, December 07, 2011 6:15 AM
Subject: [spectrumanalyzer] Hot Air Soldering

This might be of interest for 3x3mm filters etc
Hot air soldering station for about $65US.

<http://www.ebay.com/itm/ATTEN-858D-SMD-Hot-Air-Rework-Station-Solder-858D-/110726694669?pt=LH_DefaultDomain_0&hash=item19c7d3470d>.

Same item also appears elsewhere on ebay.

I received mine a couple of weeks ago and have found it very easy to use - only on some old cellphone boards as a trial.
No idea how long it'll last....but at the price.....

Make sure you get one with the correct voltage though - mine needs 230v as the southern hemisphere electrons are only half the size of the US ones.
It arrived quite quickly,about 10days. It is small enough to easily fit on my rather messy workbench.

Peter
ZL2AYX

8856. Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 21:45:38 UTC
From: william sprowls
Topic: 8774 Message: 8856

Hi Geoff,
 It is a good question. Here are the numbers.
Using SWA Filter / Amplifier first, then the dual SAWS will increase the total gain of the MSA chain about 5 dB (or what your normal loss of your Cavity Filter is). It will increase the MSA noise floor about 2.5 dB. This is good compromise, more gain than noise.
 Now, using the dual SAWS feeding the SWA Filter / Amplifier has the same gain increase, 2.5 dB. However the MSA noise floor will increase (above using the Cavity Filter) about 14.5 dB. You will lose about 12 dB of dynamic range.
Scotty

--- On Fri, 12/9/11, Geoff Moore <m0ore@...> wrote:

From: Geoff Moore <m0ore@...>
Subject: Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
To: spectrumanalyzer@yahoogroups.com
Date: Friday, December 9, 2011, 3:27 PM

Looking at the schematic in the files section, could the input from mixer1

be connected to J3, J4 connected to J1 and the output taken from J2. The pad

preceding J4 could be bypassed and the pad following J1 increased to 6dB.

Same overall gain but lower input to SAW's. Only snag may be lack of pad to

improve Z match from mixer to SAW.

My coax filter is no work of art but it works OK, the extra space gained by

the new filter would allow for extra goodies.

Geoff

----- Original Message -----

From: "nealmartini" <nealmartini@...>

To: <spectrumanalyzer@yahoogroups.com>

Sent: Friday, December 09, 2011 8:26 PM

Subject: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA

Cavity Filter

Sam,

I did not spend a lot of time characterizing it yet, but The overall response actually looks very good when I put the Dual SAW module in front of the the AMP SAW module. I thought that might be pertinent to the discussion your having.

Neal

8857. Re: [spectrumanalyzer] Re: SLIM PDM with Rev 0 pwb

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 21:52:58 UTC
From: william sprowls
Topic: 8736 Message: 8857

Hi Steve,
 The FB1 is most correct. However, it can be replaced with the 10 ohm resistor (or even larger) to help decrease low frequency input noise. Originally the bead was used to help prevent the very high harmonics of the PDM action (huge 10.7 MHz) from radiating from the input power line. If I were to do a re-design, I would use both in series.
Scotty

--- On Fri, 12/9/11, Steve <steve65@...> wrote:

From: Steve <steve65@suddenlink.net>
Subject: Re: [spectrumanalyzer] Re: SLIM PDM with Rev 0 pwb
To: spectrumanalyzer@yahoogroups.com
Date: Friday, December 9, 2011, 3:29 PM

Thanks for the clarification and advice.

Scotty -- another question. The Rev A schematic has R11, 10 ohms, at the

10VDC input to the PWB. The picture appears to have a ferrite at that

location on the PWB, while the PWB layout has the component labelled as

FB1 and R11 is not included on the Rev A parts list.

Is the schematic correct? If so, the picture, PWB layout and parts list

are in error?

Advice?

Thanks.

Steve K8JQ

On 12/5/2011 9:30 PM, william sprowls wrote:

>

>

> Hi Steve,

> Sam is right, it really doesn't matter which scheme you use. By

> theory, powering the final stage of the PDM from the ADC module should

> give more accuracy to the MSA (Mod 4). However, powering the ADC from

> the PDM is an easier modification. I have done both and can see no

> difference in accuracy. I may just delete Mod 4 to simplify things.

> The "no mod" scheme is to power the PDM and ADC independently from

> the 10v on the Control Board. Here, I did see a significant

> difference, due to the modules having different temperature changes.

> The error over a large temperature change was a little over 1 degree

> in phase error.

> Scotty

>

> --- On *Mon, 12/5/11, Sam /<swetterlin@...>/* wrote:

>

>

> From: Sam <swetterlin@...t>

> Subject: [spectrumanalyzer] Re: SLIM PDM with Rev 0 pwb

> To: spectrumanalyzer@yahoogroups.com

> Date: Monday, December 5, 2011, 7:24 PM

>

> The important thing is that both the output flip-flop of the PDM

> and ADC have the same power supply, so the max PDM output voltage

> matches what the ADC expects. As I recall, I ended up powering the

> two modules in the opposite way that Scotty did, but I think I had

> to cut a trace on one of the modules to avoid the two regulators

> directly battling.

> Sam W.

>

> --- In spectrumanalyzer@yahoogroups.com

> </mc/compose?to=spectrumanalyzer%40yahoogroups.com>, Steve

> <steve65@...> wrote:

> >

> > Thanks for the advice. And I've learned over the years to label

> everything!

> >

> > One more question if I may: The web page for the PDM, near the

> end, has

> > a section that begins "MOD 4: Allows the Phase Detector IC (U5)

> to be

> > powered by the SLIM-ADC module." The web page for the ADC, near the

> > beginning, has a section with whose opening sentence reads "This

> > optional modification allows the SLIM-ADC-16 to be powered

> directly by

> > the Phase Detector Module's regulated +5 volts." So it appears that

> > either module can power the other. Does it matter which powers

> which? Is

> > there a preference?

> >

> > Steve K8JQ

> >

> > On 12/4/2011 10:32 PM, william sprowls wrote:

> > >

> > >

> > > Hi Steve,

> > > Since your board is blank, I would build it up with the mods.

> rather

> > > than build a RevA and then modify it. It is easiest to slice

> those 4

> > > traces on an empty board. The SLIM-RevA (PWB-Rev0) with mods

> is just

> > > as accurate as RevC. There was no special name given to the

> RevA with

> > > mods, other than just to say "my RevA has all the mods". When you

> > > finish, I would mark the bottom of the pwb, "PDM-RevA",

> "modified",

> > > and the date you did it. Years from now you won't have to

> scratch your

> > > head or lift the lid to verify what it is.

> > > Scotty

> > >

> > > --- On *Sun, 12/4/11, Steve /<steve65@...>/* wrote:

> > >

> > >

> > > From: Steve <steve65@...>

> > > Subject: Re: [spectrumanalyzer] SLIM PDM with Rev 0 pwb

> > > To: spectrumanalyzer@yahoogroups.com

> </mc/compose?to=spectrumanalyzer%40yahoogroups.com>

> > > Date: Sunday, December 4, 2011, 8:49 PM

> > >

> > > Scotty,

> > >

> > > I continue to plod along on my second phase detector SLIM and

> would

> > > appreciate your advice to ensure I'm headed in the right

> > > direction. My

> > > goal is to have a PDM with the latest available modifications.

> > >

> > > Keeping in mind that I have a Rev 0 PWB, here's what I plan to do:

> > > 1. Construct a Rev A phase detector module based upon SLIM-PDM

> Rev A,

> > > SKSLIM-PDM Rev A, PWB-PDM Rev 0 and PLSLIM-PDM Rev A.

> > > 2. Implement the four MOD's detailed at the end of the current web

> > > page

> > > in the section entitled "Updated 10-21-08 Modification of the

> > > SLIM-PDM-revA".

> > >

> > > Do those steps sound right?

> > >

> > > Given that I have a "blank" PWB, is there merit in building

> the Rev A

> > > PDM and testing it in my working MSA prior to implementing the

> four

> > > MOD's? Or would it make for easier construction to incorporate the

> > > four

> > > MOD's into the first-pass build?

> > >

> > > Is there an "official" nomenclature for the Rev A PDM SLIM that

> > > has the

> > > four MOD's? Is there a rev level? Or is it just known as "Rev A

> > > with the

> > > four MOD's"? :-)

> > >

> > > Is the performance of the "Rev A with the four MOD's" equivalent

> > > to the

> > > Rev C PDM SLIM?

> > >

> > > Thanks.

> > >

> > > Steve K8JQ

> > >

> > > On 11/25/2011 10:12 AM, william sprowls wrote:

> > > >

> > > >

> > > > Hi Steve,

> > > > I updated the PDM web page:

> > > > http://scottyspectrumanalyzer.com/slim_PDM.html

> > > > It now links the archived documents for what you need. Be sure

> > > to do a

> > > > "refresh" in your browser to get the latest page.

> > > > Scotty

> > > >

> > > > --- On *Thu, 11/24/11, Steve /<steve65@...

> > > </mc/compose?to=steve65%40suddenlink.net>>/* wrote:

> > > >

> > > >

> > > > From: Steve <steve65@...

> > > </mc/compose?to=steve65%40suddenlink.net>>

> > > > Subject: [spectrumanalyzer] SLIM PDM with Rev 0 pwb

> > > > To: spectrumanalyzer@yahoogroups.com

> </mc/compose?to=spectrumanalyzer%40yahoogroups.com>

> > > </mc/compose?to=spectrumanalyzer%40yahoogroups.com>

> > > > Date: Thursday, November 24, 2011, 4:59 PM

> > > >

> > > > Scotty,

> > > >

> > > > The phase detector module I constructed a couple of years

> ago uses

> > > > a Rev

> > > > 0 PWB and does not have the improvements for phase resolution or

> > > > one-shot stability that were developed later.

> > > >

> > > > I have another phase detector Rev 0 PWB with which I'd like to

> > > > construct

> > > > a second phase detector module with the improved operation -- I

> > > think

> > > > that would make it a REV C SLIM. After I get the second one

> > > > working, I

> > > > plan to modify the first one for the same improvements.

> > > >

> > > > Sadly, I have lost the printed copies I had of the parts list,

> > > > schematic

> > > > and text description related to the Rev 0 PWB. Seems to me I

> need

> > > > those

> > > > as a starting point. Are those documents still available? If

> > > they are

> > > > out there on the web site, perhaps you could point me to them?

> > > >

> > > > Thanks.

> > > >

> > > > Steve K8JQ

>

8858. Re: [spectrumanalyzer] Re: SLIM PDM with Rev 0 pwb

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 22:03:09 UTC
From: Steve
Topic: 8736 Message: 8858

Thanks Scotty. Looks like there might be room on the PWB to install both components, I'll try to to that.

Steve K8JQ

On 12/9/2011 4:52 PM, william sprowls wrote:
>
>
> Hi Steve,
> The FB1 is most correct. However, it can be replaced with the 10 ohm
> resistor (or even larger) to help decrease low frequency input noise.
> Originally the bead was used to help prevent the very high harmonics
> of the PDM action (huge 10.7 MHz) from radiating from the input power
> line. If I were to do a re-design, I would use both in series.
> Scotty
>
> --- On *Fri, 12/9/11, Steve /<steve65@...>/* wrote:
>
>
> From: Steve <steve65@...>
> Subject: Re: [spectrumanalyzer] Re: SLIM PDM with Rev 0 pwb
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, December 9, 2011, 3:29 PM
>
> Thanks for the clarification and advice.
>
> Scotty -- another question. The Rev A schematic has R11, 10 ohms,
> at the
> 10VDC input to the PWB. The picture appears to have a ferrite at that
> location on the PWB, while the PWB layout has the component
> labelled as
> FB1 and R11 is not included on the Rev A parts list.
>
> Is the schematic correct? If so, the picture, PWB layout and parts
> list
> are in error?
>
> Advice?
>
> Thanks.
>
> Steve K8JQ
>
> On 12/5/2011 9:30 PM, william sprowls wrote:
> >

> >
> > Hi Steve,
> > Sam is right, it really doesn't matter which scheme you use. By
> > theory, powering the final stage of the PDM from the ADC module
> should
> > give more accuracy to the MSA (Mod 4). However, powering the ADC
> from
> > the PDM is an easier modification. I have done both and can see no
> > difference in accuracy. I may just delete Mod 4 to simplify things.
> > The "no mod" scheme is to power the PDM and ADC independently from
> > the 10v on the Control Board. Here, I did see a significant
> > difference, due to the modules having different temperature
> changes.
> > The error over a large temperature change was a little over 1
> degree
> > in phase error.
> > Scotty
> >
> > --- On *Mon, 12/5/11, Sam /<swetterlin@...
> </mc/compose?to=swetterlin%40comcast.net>>/* wrote:
> >
> >
> > From: Sam <swetterlin@...
> </mc/compose?to=swetterlin%40comcast.net>>
> > Subject: [spectrumanalyzer] Re: SLIM PDM with Rev 0 pwb
> > To: spectrumanalyzer@yahoogroups.com
> </mc/compose?to=spectrumanalyzer%40yahoogroups.com>
> > Date: Monday, December 5, 2011, 7:24 PM
> >
> > The important thing is that both the output flip-flop of the PDM
> > and ADC have the same power supply, so the max PDM output voltage
> > matches what the ADC expects. As I recall, I ended up powering the
> > two modules in the opposite way that Scotty did, but I think I had
> > to cut a trace on one of the modules to avoid the two regulators
> > directly battling.
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com
> </mc/compose?to=spectrumanalyzer%40yahoogroups.com>
> > </mc/compose?to=spectrumanalyzer%40yahoogroups.com>, Steve
> > <steve65@...> wrote:
> > >
> > > Thanks for the advice. And I've learned over the years to label
> > everything!
> > >
> > > One more question if I may: The web page for the PDM, near the
> > end, has
> > > a section that begins "MOD 4: Allows the Phase Detector IC (U5)
> > to be
> > > powered by the SLIM-ADC module." The web page for the ADC,

> near the
> > > beginning, has a section with whose opening sentence reads "This
> > > optional modification allows the SLIM-ADC-16 to be powered
> > directly by
> > > the Phase Detector Module's regulated +5 volts." So it appears
> that
> > > either module can power the other. Does it matter which powers
> > which? Is
> > > there a preference?
> > >
> > > Steve K8JQ
> > >
> > > On 12/4/2011 10:32 PM, william sprowls wrote:
> > > >
> > > >
> > > > Hi Steve,
> > > > Since your board is blank, I would build it up with the mods.
> > rather
> > > > than build a RevA and then modify it. It is easiest to slice
> > those 4
> > > > traces on an empty board. The SLIM-RevA (PWB-Rev0) with mods
> > is just
> > > > as accurate as RevC. There was no special name given to the
> > RevA with
> > > > mods, other than just to say "my RevA has all the mods".
> When you
> > > > finish, I would mark the bottom of the pwb, "PDM-RevA",
> > "modified",
> > > > and the date you did it. Years from now you won't have to
> > scratch your
> > > > head or lift the lid to verify what it is.
> > > > Scotty
> > > >
> > > > --- On *Sun, 12/4/11, Steve /<steve65@...>/* wrote:
> > > >
> > > >
> > > > From: Steve <steve65@...>
> > > > Subject: Re: [spectrumanalyzer] SLIM PDM with Rev 0 pwb
> > > > To: spectrumanalyzer@yahoogroups.com
> </mc/compose?to=spectrumanalyzer%40yahoogroups.com>
> > </mc/compose?to=spectrumanalyzer%40yahoogroups.com>
> > > > Date: Sunday, December 4, 2011, 8:49 PM
> > > >
> > > > Scotty,
> > > >
> > > > I continue to plod along on my second phase detector SLIM and
> > would
> > > > appreciate your advice to ensure I'm headed in the right
> > > > direction. My
> > > > goal is to have a PDM with the latest available modifications.

> > > >
> > > > Keeping in mind that I have a Rev 0 PWB, here's what I plan
> to do:
> > > > 1. Construct a Rev A phase detector module based upon SLIM-PDM
> > Rev A,
> > > > SKSLIM-PDM Rev A, PWB-PDM Rev 0 and PLSLIM-PDM Rev A.
> > > > 2. Implement the four MOD's detailed at the end of the
> current web
> > > > page
> > > > in the section entitled "Updated 10-21-08 Modification of the
> > > > SLIM-PDM-revA".
> > > >
> > > > Do those steps sound right?
> > > >
> > > > Given that I have a "blank" PWB, is there merit in building
> > the Rev A
> > > > PDM and testing it in my working MSA prior to implementing the
> > four
> > > > MOD's? Or would it make for easier construction to
> incorporate the
> > > > four
> > > > MOD's into the first-pass build?
> > > >
> > > > Is there an "official" nomenclature for the Rev A PDM SLIM that
> > > > has the
> > > > four MOD's? Is there a rev level? Or is it just known as "Rev A
> > > > with the
> > > > four MOD's"? :-)
> > > >
> > > > Is the performance of the "Rev A with the four MOD's" equivalent
> > > > to the
> > > > Rev C PDM SLIM?
> > > >
> > > > Thanks.
> > > >
> > > > Steve K8JQ
> > > >
> > > > On 11/25/2011 10:12 AM, william sprowls wrote:
> > > > >
> > > > >
> > > > > Hi Steve,
> > > > > I updated the PDM web page:
> > > > > http://scottyspectrumanalyzer.com/slim_PDM.html
> > > > > It now links the archived documents for what you need. Be sure
> > > > to do a
> > > > > "refresh" in your browser to get the latest page.
> > > > > Scotty
> > > > >
> > > > > --- On *Thu, 11/24/11, Steve /<steve65@...
> > > > </mc/compose?to=steve65%40suddenlink.net>>/* wrote:

> > > > >
> > > > >
> > > > > From: Steve <steve65@...
> > > > </mc/compose?to=steve65%40suddenlink.net>>
> > > > > Subject: [spectrumanalyzer] SLIM PDM with Rev 0 pwb
> > > > > To: spectrumanalyzer@yahoogroups.com
> </mc/compose?to=spectrumanalyzer%40yahoogroups.com>
> > </mc/compose?to=spectrumanalyzer%40yahoogroups.com>
> > > > </mc/compose?to=spectrumanalyzer%40yahoogroups.com>
> > > > > Date: Thursday, November 24, 2011, 4:59 PM
> > > > >
> > > > > Scotty,
> > > > >
> > > > > The phase detector module I constructed a couple of years
> > ago uses
> > > > > a Rev
> > > > > 0 PWB and does not have the improvements for phase
> resolution or
> > > > > one-shot stability that were developed later.
> > > > >
> > > > > I have another phase detector Rev 0 PWB with which I'd like to
> > > > > construct
> > > > > a second phase detector module with the improved operation
> -- I
> > > > think
> > > > > that would make it a REV C SLIM. After I get the second one
> > > > > working, I
> > > > > plan to modify the first one for the same improvements.
> > > > >
> > > > > Sadly, I have lost the printed copies I had of the parts list,
> > > > > schematic
> > > > > and text description related to the Rev 0 PWB. Seems to me I
> > need
> > > > > those
> > > > > as a starting point. Are those documents still available? If
> > > > they are
> > > > > out there on the web site, perhaps you could point me to them?
> > > > >
> > > > > Thanks.
> > > > >
> > > > > Steve K8JQ
> >
>
>
>
>

--
Read The Patriot Post Vertitas vos Liberabit
http://patriotpost.us/subscription/

8859. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-09 23:39:15 UTC
From: John
Topic: 8774 Message: 8859

Hi Neal,

Please add me to the list for 1 set.

Thanks,

John G6KJK

8860. Re: Coax Filter build and 1013 MHz SAW Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-10 01:36:38 UTC
From: Len
Topic: 8844 Message: 8860

Hello Group: Notice to the N buyers of my coax filters.

Do not worry, whatever qty the coax buying fraternity needs (where N >= 1)
, I will supply it.

It is a handmade product so how many I make is not an issue.

There are no hard feelings and I might even buy a SAW filter or 2 myself
(grin).

True story:

A few moons ago I did send various SAW data sheets (another brand) to Scotty
and asked about their suitability as a coax replacement.

Typical engineer doing his/her self out of a job !

But Scotty was not keen on them.

Life has ironic moments doesn't it?

Regards Len

8861. SAW Filter Amplifier

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-10 05:26:54 UTC
From: william
Topic: 8861 Message: 8861

Hi All,
I published a new web page for the SAW Filter Amplifier.
http://www.scottyspectrumanalyzer.com/slim_sfa_1013.html
Neal's pictures and plot results are posted there.
Neal will be sending me his SAW devices for further testing. I will update the web page as my testing progresses.
Scotty

8862. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-10 07:21:04 UTC
From: Michel
Topic: 8774 Message: 8862

Hi Neal,

Please add me for 1 set.

8863. Re: Coax Filter build and 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-10 07:31:54 UTC
From: Michel
Topic: 8814 Message: 8863

Hi Len,

You can rely on my participation, I stay onto the coax filter list.

--- In spectrumanalyzer@yahoogroups.com, "Len" <redmond2@...> wrote:
>
> Hello Group: Coax filter buyers note:
>
>
>
> I have received orders for 13 coax filter units. Now this SAW filter turns
> up out of the blue.
>
> Some coax buyers may be in a conundrum.
>
> The Coax filter build is a hobby for me ($0 on my time) any profit is on
> the machined parts.
>
> Therefore I will accept the cancellation for a coax filter order, but please
> let me know before 15 DEC.
>
>
>
> Regards
>
> Len Spyker
>

8864. RE: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-10 08:12:29 UTC
From: F4CNY
Topic: 8774 Message: 8864

Hi Neal,

Adendum.

Two kits, one with filter SAW amplifier and the other with two filters SAW.
If it's possible ?
Thanks for all.
Regards.
Ennio, F4CNY
-----Message d'origine-----
De : spectrumanalyzer@yahoogroups.com
[mailto:spectrumanalyzer@yahoogroups.com]De la part de Michel
Envoy? : samedi 10 d?cembre 2011 08:21
? : spectrumanalyzer@yahoogroups.com
Objet : [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA
Cavity Filter

Hi Neal,

Please add me for 1 set.

8865. Band selection and the control board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-10 10:41:46 UTC
From: Martin
Topic: 8865 Message: 8865

Hi Scotty and all

I have done a bit of snooping on the groups messages and have found a thread chatting about a software controlled RF band switch, but could not find it actually implemented.

I am lazy and would like to remove the 1G/3G - 2G patch arrangement, switching it with relays via the software (rather than a user operated switch).

Do any outputs on control board change with the software band selection?

Regards

Marty

8866. Re: [spectrumanalyzer] Band selection and the control board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-10 13:02:11 UTC
From: william sprowls
Topic: 8865 Message: 8866

Hi Marty,
Yes, they do. They are implemented using the SLIM Control Board. They also work with USB addition.
Scotty

--- On Sat, 12/10/11, Martin <martin.driscoll@...> wrote:

From: Martin <martin.driscoll@...>
Subject: [spectrumanalyzer] Band selection and the control board
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, December 10, 2011, 4:41 AM

Hi Scotty and all

I have done a bit of snooping on the groups messages and have found a thread chatting about a software controlled RF band switch, but could not find it actually implemented.

I am lazy and would like to remove the 1G/3G - 2G patch arrangement, switching it with relays via the software (rather than a user operated switch).

Do any outputs on control board change with the software band selection?

Regards

Marty

8867. Re: Band selection and the control board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-10 14:14:23 UTC
From: Sam
Topic: 8865 Message: 8867

U4 on the control board has the following bits:

P4-1 = Ground
P4-2 = D0 VS0 Video Selection
P4-3 = D1 VS1 Video Selection
P4-4 = D2 BS0 Band Selection, low order bit
P4-5 = D3 BS1 Band Selection, high order bit
P4-6 = D4 FR DUT Direction, Forward (0) or Reverse
P4-7 = D5 TR VNA Selection, Transmission (0) or Reflection
P4-8 = D6 Spare
P4-9 = D7 PS Pulse Start (a/k/a Latch Pulse), common to all latching relays. Normally high; pulsed low for 2-20 us to trigger relay latching.

You use the PS signal to initiate latching if you use a latching relay. Otherwise, just use BS0 and BS1 (=binary 1, 2 or 3). If you aren't switching filtering or some such thing, 1G and 3G are the same thing, so the low order bit BS0 is all you need for control, with 1=1G/3G and 0=2G.

A coax relay may be convenient, but you don't really need one. A single RF switch like the PE4251 will provide all the isolation you need. Someone (I forget who) recently had the idea of putting an RF switch on the diplexer board. I don't know if he ever actually did that.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Marty,
> Yes, they do. They are implemented using the SLIM Control Board. They also work with USB addition.
> Scotty
>
> --- On Sat, 12/10/11, Martin <martin.driscoll@...> wrote:
>
> From: Martin <martin.driscoll@...>
> Subject: [spectrumanalyzer] Band selection and the control board
> To: spectrumanalyzer@yahoogroups.com
> Date: Saturday, December 10, 2011, 4:41 AM
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> Hi Scotty and all
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>
> I have done a bit of snooping on the groups messages and have found a thread chatting about a software controlled RF band switch, but could not find it actually implemented.
>
>
>
> I am lazy and would like to remove the 1G/3G - 2G patch arrangement, switching it with relays via the software (rather than a user operated switch).
>
>
>
> Do any outputs on control board change with the software band selection?
>
>
>
> Regards
>
>
>
> Marty
>

8868. Re: [spectrumanalyzer] Re: Band selection and the control board

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-10 15:04:00 UTC
From: Jim Hontoria
Topic: 8865 Message: 8868

I placed the PE4251 in a small board together with the diplexer. A very compact solution. Somewhere I have two of these boards for anyone interested.

Jim Hontoria, w1jgh

On Dec 10, 2011, at 9:14, "Sam" <swetterlin@comcast.net> wrote:

> U4 on the control board has the following bits:
>
> P4-1 = Ground
> P4-2 = D0 VS0 Video Selection
> P4-3 = D1 VS1 Video Selection
> P4-4 = D2 BS0 Band Selection, low order bit
> P4-5 = D3 BS1 Band Selection, high order bit
> P4-6 = D4 FR DUT Direction, Forward (0) or Reverse
> P4-7 = D5 TR VNA Selection, Transmission (0) or Reflection
> P4-8 = D6 Spare
> P4-9 = D7 PS Pulse Start (a/k/a Latch Pulse), common to all latching relays. Normally high; pulsed low for 2-20 us to trigger relay latching.
>
> You use the PS signal to initiate latching if you use a latching relay. Otherwise, just use BS0 and BS1 (=binary 1, 2 or 3). If you aren't switching filtering or some such thing, 1G and 3G are the same thing, so the low order bit BS0 is all you need for control, with 1=1G/3G and 0=2G.
>
> A coax relay may be convenient, but you don't really need one. A single RF switch like the PE4251 will provide all the isolation you need. Someone (I forget who) recently had the idea of putting an RF switch on the diplexer board. I don't know if he ever actually did that.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
> >
> > Hi Marty,
> > Yes, they do. They are implemented using the SLIM Control Board. They also work with USB addition.
> > Scotty
> >
> > --- On Sat, 12/10/11, Martin <martin.driscoll@...> wrote:
> >
> > From: Martin <martin.driscoll@...>
> > Subject: [spectrumanalyzer] Band selection and the control board
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Saturday, December 10, 2011, 4:41 AM
> >

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> >
> > Hi Scotty and all
> >
> >
> >
> > I have done a bit of snooping on the groups messages and have found a thread chatting about a software controlled RF band switch, but could not find it actually implemented.
> >
> >
> >
> > I am lazy and would like to remove the 1G/3G - 2G patch arrangement, switching it with relays via the software (rather than a user operated switch).
> >
> >
> >
> > Do any outputs on control board change with the software band selection?
> >
> >
> >
> > Regards
> >
> >
> >
> > Marty
> >
>

>

8869. Re: [spectrumanalyzer] Re: Coax Filter build and 1013 MHz SAW Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-10 15:26:45 UTC
From: Jim Hontoria
Topic: 8844 Message: 8869

Could you do the filter with five (5) cavities? i am thinking about a preamp followed by it.

Jim Hontoria, w1jgh

On Dec 9, 2011, at 20:36, "Len" <redmond2@...> wrote:

> Hello Group: Notice to the N buyers of my coax filters.
>
>
>
> Do not worry, whatever qty the coax buying fraternity needs (where N >= 1) , I will supply it.
>
> It is a handmade product so how many I make is not an issue.
>
> There are no hard feelings and I might even buy a SAW filter or 2 myself (grin).
>
>
>
> True story:
>
> A few moons ago I did send various SAW data sheets (another brand) to Scotty and asked about their suitability as a coax replacement.
>
> Typical engineer doing his/her self out of a job !
>
> But Scotty was not keen on them.
>
> Life has ironic moments doesn’t it?
>
>
>
> Regards Len
>
>
>
>
>
>
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>

8870. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-10 15:28:35 UTC
From: inlinebeginner
Topic: 8774 Message: 8870

The SAW filter may be for portable MSA.
For desktop MSA, I think the original cavity filter might be better.

RF test equipment needs some weight, if it is too light, the RF cable could hold the equipment in air (or dominates equipment location), and it is hard to use. Cavity filter not only has better performance, but also has the desired weight.

Cavity filter is one of the major arts of the MSA design, I learnt a lot from this cavity filter. I did some tests on this cavity filter recently, the tests show that with some small structure change (make it simple), this filter can be a tunerable cavitifilter from 950MHz to 2.1GHz (I did not try above 2.1GHz, I think it still works very well), which will give us a lot of flexibility if you really want to use the MSA as your RF receiver design platform.

Lin

--- In spectrumanalyzer@yahoogroups.com, "F4CNY" <f4cny@...> wrote:
>
> Hi Neal,
>
> Adendum.
>
> Two kits, one with filter SAW amplifier and the other with two filters SAW.
> If it's possible ?
> Thanks for all.
> Regards.
> Ennio, F4CNY
> -----Message d'origine-----
> De : spectrumanalyzer@yahoogroups.com
> [mailto:spectrumanalyzer@yahoogroups.com]De la part de Michel
> Envoy? : samedi 10 décembre 2011 08:21
> ? : spectrumanalyzer@yahoogroups.com
> Objet : [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA
> Cavity Filter
>
>
>
> Hi Neal,
>
> Please add me for 1 set.
>

8871. Re: [spectrumanalyzer] SAW Filter Amplifier

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-10 15:45:57 UTC
From: Jim Hontoria
Topic: 8861 Message: 8871

It seems to me that the combination of the narrower bandwith of the cavity with the rejection of the saw is the ideal solution. I wouldn' throw away those cavities.

Jim Hontoria, w1jgh

On Dec 10, 2011, at 0:26, "william" <wsprowls@...> wrote:

> Hi All,
> I published a new web page for the SAW Filter Amplifier.
> http://www.scottyspectrumanalyzer.com/slim_sfa_1013.html
> Neal's pictures and plot results are posted there.
> Neal will be sending me his SAW devices for further testing. I will update the web page as my testing progresses.
> Scotty
>
>

8872. Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-10 15:59:45 UTC
From: w4zcb
Topic: 8774 Message: 8872

I have made 2 cavity filters to clean up a doubled 245 MHz OCXO, as well as a 4 cavity design to clean up another that is quadrupled to 980 MHz for an AD 9910 clock. I'm a bit surprised that you can get it up to 2 GHz, but it sure should operate at 3 GHz with the tuning rods acting as 3/4 wave rods.

W4ZCB

The SAW filter may be for portable MSA.
For desktop MSA, I think the original cavity filter might be better.

RF test equipment needs some weight, if it is too light, the RF cable could hold the equipment in air (or dominates equipment location), and it is hard to use. Cavity filter not only has better performance, but also has the desired weight.

Cavity filter is one of the major arts of the MSA design, I learnt a lot from this cavity filter. I did some tests on this cavity filter recently, the tests show that with some small structure change (make it simple), this filter can be a tunerable cavitifilter from 950MHz to 2.1GHz (I did not try above 2.1GHz, I think it still works very well), which will give us a lot of flexibility if you really want to use the MSA as your RF receiver design platform.

Lin

--- In spectrumanalyzer@yahoogroups.com, "F4CNY" <f4cny@...> wrote:
>
> Hi Neal,
>
> Adendum.
>
> Two kits, one with filter SAW amplifier and the other with two
> filters SAW.
> If it's possible ?
> Thanks for all.
> Regards.
> Ennio, F4CNY
> -----Message d'origine-----
> De : spectrumanalyzer@yahoogroups.com
> [mailto:spectrumanalyzer@yahoogroups.com]De la part de Michel
> Envoy? : samedi 10 d?cembre 2011 08:21
> ? : spectrumanalyzer@yahoogroups.com
> Objet : [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for
> the MSA

> Cavity Filter
>
>
>
> Hi Neal,
>
> Please add me for 1 set.
>

8873. Re: SAW Filter Amplifier

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-10 23:44:26 UTC
From: Sam
Topic: 8861 Message: 8873

Jim,
I had a similar thought, that you could use the single SAW+amp, followed by a cavity two-holer. I believe you can get 50 dB rejection from each. That would greatly simplify the cavity filter and give a response that would be narrower at the top, which I think is helpful for some spurs.

Even better, perhaps, is to do cavity(2 hole)-amp-SAW-pad. That creates just 2-4 dB of loss before the amp. The ERA-33 may have too much gain for this arrangement, but I'm sure a suitable amp could be found.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> It seems to me that the combination of the narrower bandwith of the cavity with the rejection of the saw is the ideal solution. I wouldn' throw away those cavities.
>
> Jim Hontoria, w1jgh
>
> On Dec 10, 2011, at 0:26, "william" <wsprowls@...> wrote:
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> > Hi All,
> > I published a new web page for the SAW Filter Amplifier.
> > http://www.scottyspectrumanalyzer.com/slim_sfa_1013.html
> > Neal's pictures and plot results are posted there.
> > Neal will be sending me his SAW devices for further testing. I will update the web page as my testing progresses.
> > Scotty
> >
> >
>

8874. Re: SAW Filter Amplifier

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-11 00:36:26 UTC
From: Sam
Topic: 8861 Message: 8874

Scotty and Neal,
I guess the problem with my previous post is that the single SAW+amp has a bump on the upper side that degrades it near 1034 MHz. So I revise my suggestion to this arrangement: pad-SAW-amp-cavity(2 holer)-pad-SAW-pad. Basically, this just replaces the second SAW with a 2-hole cavity filter. This also alleviates any concern over the SAW following the amp receiving too much power. In fact, given the saturation level of the ERA-33, and the loss in the cavity and the subsequent pad, it may be impossible for the final SAW to receive too much power. (We'll call that "Too protected to fail.")

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Jim,
> I had a similar thought, that you could use the single SAW+amp, followed by a cavity two-holer. I believe you can get 50 dB rejection from each. That would greatly simplify the cavity filter and give a response that would be narrower at the top, which I think is helpful for some spurs.
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> Even better, perhaps, is to do cavity(2 hole)-amp-SAW-pad. That creates just 2-4 dB of loss before the amp. The ERA-33 may have too much gain for this arrangement, but I'm sure a suitable amp could be found.
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>

8875. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-11 03:43:07 UTC
From: inlinebeginner
Topic: 8774 Message: 8875

To work at 2GHz, the rods have to be tunable.
Lin

--- In spectrumanalyzer@yahoogroups.com, "w4zcb" <w4zcb@...> wrote:
>
> I have made 2 cavity filters to clean up a doubled 245 MHz OCXO, as
> well as a 4 cavity design to clean up another that is quadrupled to
> 980 MHz for an AD 9910 clock. I'm a bit surprised that you can get it
> up to 2 GHz, but it sure should operate at 3 GHz with the tuning rods
> acting as 3/4 wave rods.
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> The SAW filter may be for portable MSA.
> For desktop MSA, I think the original cavity filter might be better.
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> RF test equipment needs some weight, if it is too light, the RF cable
> could hold the equipment in air (or dominates equipment location), and
> it is hard to use. Cavity filter not only has better performance, but
> also has the desired weight.
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> it simple), this filter can be a tunerable cavitifilter from 950MHz to
> 2.1GHz (I did not try above 2.1GHz, I think it still works very well),
> which will give us a lot of flexibility if you really want to use the
> MSA as your RF receiver design platform.
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> Lin
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> --- In spectrumanalyzer@yahoogroups.com, "F4CNY" <f4cny@> wrote:
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> > Hi Neal,
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> > Adendum.
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> > Two kits, one with filter SAW amplifier and the other with two
> > filters SAW.
> > If it's possible ?
> > Thanks for all.
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> > Ennio, F4CNY
> > -----Message d'origine-----
> > De : spectrumanalyzer@...m

> > [mailto:spectrumanalyzer@yahoogroups.com]De la part de Michel
> > Envoy? : samedi 10 décembre 2011 08:21
> > ? : spectrumanalyzer@yahoogroups.com
> > Objet : [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for
> > the MSA
> > Cavity Filter
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8876. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-11 03:58:01 UTC
From: inlinebeginner
Topic: 8774 Message: 8876

Scotty
If we care about the 2.5dB noise floor increase, maybe we can use a better LNA. Several month ago, MA-COM show me a LNA, MAAL-010570£¬ NF is around 0.8dB at 1GHz. IP3> 34dBm. ERA-33 has 3.3dB NF at 1GHz, if we replace it with MAAL-010570, we can get the noise floor down by about 2.5dB.
Lin

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Geoff,
> Â It is a good question. Here are the numbers.
> Using SWA Filter / Amplifier first, then the dual SAWS will increase the total gain of the MSA chain about 5 dB (or what your normal loss of your Cavity Filter is). It will increase the MSA noise floor about 2.5 dB. This is good compromise, more gain than noise.
> Â Now, using the dual SAWS feeding the SWA Filter / Amplifier has the same gain increase, 2.5 dB. However the MSA noise floor will increase (above using the Cavity Filter) about 14.5 dB. You will lose about 12 dB of dynamic range.
> Scotty
>
> --- On Fri, 12/9/11, Geoff Moore <m0ore@...> wrote:
>
> From: Geoff Moore <m0ore@...>
> Subject: Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, December 9, 2011, 3:27 PM
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> Same overall gain but lower input to SAW's. Only snag may be lack of pad to
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> My coax filter is no work of art but it works OK, the extra space gained by
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> the new filter would allow for extra goodies.
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> Geoff
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>
> ----- Original Message -----
>
> From: "nealmartini" <nealmartini@...>
>
> To: <spectrumanalyzer@yahoogroups.com>
>
> Sent: Friday, December 09, 2011 8:26 PM
>
> Subject: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA
>
> Cavity Filter
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> Sam,
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> I did not spend a lot of time characterizing it yet, but The overall

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> the the AMP SAW module. I thought that might be pertinent to the discussion
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> your having.
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> Neal
>

8877. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-11 04:57:27 UTC
From: inlinebeginner
Topic: 8774 Message: 8877

Scotty
If we use 2.5dBpad + SWA + MAAL010570 + SAW + 3.5dBpad + SAW+3.5dBpad
We will get exact same noise floor as the original cavity filter (Noise figure 7.16dB, gain =0dB), according to the calculation.

Lin

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Scotty
> If we care about the 2.5dB noise floor increase, maybe we can use a better LNA. Several month ago, MA-COM show me a LNA, MAAL-010570£¬ NF is around 0.8dB at 1GHz. IP3> 34dBm.
> ERA-33 has 3.3dB NF at 1GHz, if we replace it with MAAL-010570, we can get the noise floor down by about 2.5dB.
> Lin
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> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
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> > Hi Geoff,
> > Â It is a good question. Here are the numbers.
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> > Â Now, using the dual SAWS feeding the SWA Filter / Amplifier has the same gain increase, 2.5 dB. However the MSA noise floor will increase (above using the Cavity Filter) about 14.5 dB. You will lose about 12 dB of dynamic range.
> > Scotty
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> > --- On Fri, 12/9/11, Geoff Moore <m0ore@> wrote:
> >
> > From: Geoff Moore <m0ore@>
> > Subject: Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Friday, December 9, 2011, 3:27 PM
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> > Geoff
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> > ----- Original Message -----
> >
> > From: "nealmartini" <nealmartini@>
> >
> > To: <spectrumanalyzer@yahoogroups.com>
> >
> > Sent: Friday, December 09, 2011 8:26 PM
> >
> > Subject: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA

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> > Cavity Filter
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> > Neal
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8878. Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-11 05:08:36 UTC
From: william sprowls
Topic: 8774 Message: 8878

Hi Lin,
 I don't think we are that concerned with a few more dB of noise. A perfect amplifier in this position would have the best noise figure and an output compression of less than +10 dBm. This would insure a safe level to the next SAW.
Scotty

--- On Sat, 12/10/11, inlinebeginner <inlinebeginner@...> wrote:

From: inlinebeginner <inlinebeginner@...>
Subject: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, December 10, 2011, 9:58 PM

Scotty

If we care about the 2.5dB noise floor increase, maybe we can use a better LNA. Several month ago, MA-COM show me a LNA, MAAL-010570£¬ NF is around 0.8dB at 1GHz. IP3> 34dBm.

ERA-33 has 3.3dB NF at 1GHz, if we replace it with MAAL-010570, we can get the noise floor down by about 2.5dB.

Lin

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:

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> Subject: Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

> To: spectrumanalyzer@yahoogroups.com

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> Geoff

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> ----- Original Message -----

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> From: "nealmartini" <nealmartini@...>

>

> To: <spectrumanalyzer@yahoogroups.com>

>

> Sent: Friday, December 09, 2011 8:26 PM

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> Subject: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA

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> Cavity Filter

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> Neal

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8879. Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-11 13:36:01 UTC
From: william sprowls
Topic: 8774 Message: 8879

Lin,
I cannot find the MAAL-010570. Do you mean the MAAL-010705? This would require a redesign of the board.
In the present design there are provisions to add a 2 dB pad between the amplifier and following SAW filter. The total noise presented to the input of Mixer 2 would be the same as using the cavity filter. The replacement modules would then have a gain of -2 dB.
 This would still be a total MSA gain improvement over the Cavity filter, but with the same noise level.
  There are several schemes to use here. Experementation is fun.
Scotty

--- On Sat, 12/10/11, inlinebeginner <inlinebeginner@...> wrote:

From: inlinebeginner <inlinebeginner@yahoo.com>
Subject: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, December 10, 2011, 10:57 PM

Scotty

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> Scotty

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> > ----- Original Message -----

> >

> > From: "nealmartini" <nealmartini@>

> >

> > To: <spectrumanalyzer@yahoogroups.com>

> >

> > Sent: Friday, December 09, 2011 8:26 PM

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> > Subject: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA

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> > Cavity Filter

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> > Neal

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8880. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-11 14:56:09 UTC
From: inlinebeginner
Topic: 8774 Message: 8880

Scotty
MAAL-010570 might be a new part, and the datasheet is not published yet. I can email it to you tomorrow. The downside is that its footprint is different from EAR-33+.

With the SAW filters, I was wondering if the maximum power at MSA input could get about 7dB worse. The maximum power is limited by the final RBW crystal filter, i.e. we do not want to overload the crystal filter. The power at crystal filter input would be 0dBm (or so). If we increase 7dB gain (it was -7dB with cavity filter, now we change to 0dB with SAW) in the FE path, that means we have to drop the maximum input power by 7dB. If the original dynamic range is -6dBm to -110dBm , with the SAW replacement, the dynamic range could change to -13dBm to -107.5dBm, this is still my guess, need to verify with test. -13dBm may not a bad number for home made SA.

A possible way that we make the dynamic range a little bit better could be that we put 10.7MHz, 1 (or 2) MHz BW BPF at outputs of IFA to suppress the noise level out band, in this way, we hope the total noise power arrives at crystal filter can be a little bit lower.

The IFAs have LPF at output, the BW might be around 40MHz (if I remember correctly), it is a little bit wide. If we can put a ceramic 1MHz BPF noise filter (or the widest RBW filter) between IFA1 and IFA2, I would expect the noise floor between 0-40MHz at crystal filter input would drop a lot. As the input level at new added BPF input is 18dB lower than the final crystal filter, it won't be overloaded. Maybe we can put one more this kind of filter between mixer 2 output and IFA1 input to see if it helps. Again, this is just some brain storming, I did not test them.
Lin

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Lin,
> I cannot find the MAAL-010570. Do you mean the MAAL-010705? This would require a redesign of the board.
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> --- On Sat, 12/10/11, inlinebeginner <inlinebeginner@...> wrote:
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> Scotty
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> If we use 2.5dBpad + SWA + MAAL010570 + SAW + 3.5dBpad + SAW+3.5dBpad
>
> We will get exact same noise floor as the original cavity filter (Noise figure 7.16dB, gain =0dB), according to the calculation.
>
>
>
> Lin
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>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
>
> >
>
> > Scotty
>
> > If we care about the 2.5dB noise floor increase, maybe we can use a better LNA. Several month ago, MA-COM show me a LNA, MAAL-010570Â£Â¬ NF is around 0.8dB at 1GHz. IP3> 34dBm.
>
> > ERA-33 has 3.3dB NF at 1GHz, if we replace it with MAAL-010570, we can get the noise floor down by about 2.5dB.

>
> > Lin
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>
> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
>
> > >
>
> > > Hi Geoff,
>
> > > ÃÂ It is a good question. Here are the numbers.
>
> > > Using SWA Filter / Amplifier first, then the dual SAWS will increase the total gain of the MSA chain about 5 dB (or what your normal loss of your Cavity Filter is). It will increase the MSA noise floor about 2.5 dB. This is good compromise, more gain than noise.
>
> > > ÃÂ Now, using the dual SAWS feeding the SWA Filter / Amplifier has the same gain increase, 2.5 dB. However the MSA noise floor will increase (above using the Cavity Filter) about 14.5 dB. You will lose about 12 dB of dynamic range.
>
> > > Scotty
>
> > >
>
> > > --- On Fri, 12/9/11, Geoff Moore <m0ore@> wrote:
>
> > >
>
> > > From: Geoff Moore <m0ore@>
>
> > > Subject: Re: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
>
> > > To: spectrumanalyzer@yahoogroups.com
>
> > > Date: Friday, December 9, 2011, 3:27 PM
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> > > Looking at the schematic in the files section, could the input from mixer1
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> > > be connected to J3, J4 connected to J1 and the output taken from J2. The pad
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> > >

>
> > > preceding J4 could be bypassed and the pad following J1 increased to 6dB.
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>
> > > Same overall gain but lower input to SAW's. Only snag may be lack of pad to
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>
> > > improve Z match from mixer to SAW.
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> > > My coax filter is no work of art but it works OK, the extra space gained by
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> > >
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> > > the new filter would allow for extra goodies.
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>
> > > Geoff
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> > >
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> > > ----- Original Message -----
>
> > >
>
> > > From: "nealmartini" <nealmartini@>
>
> > >
>

> > > To: <spectrumanalyzer@yahoogroups.com>
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> > >
>
> > > Sent: Friday, December 09, 2011 8:26 PM
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> > >
>
> > > Subject: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA
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>
> > > Cavity Filter
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> > > Sam,
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> > > I did not spend a lot of time characterizing it yet, but The overall
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> > > response actually looks very good when I put the Dual SAW module in front of
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> > > the the AMP SAW module. I thought that might be pertinent to the discussion
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> > > your having.
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> > > Neal

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8881. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-11 17:25:17 UTC
From: Sam
Topic: 8774 Message: 8881

Scotty,
Here is a nice compromise amp: the Minicircuits LEE-39. It's a 3 mm square package with leads at the corners, but it appears that if you place it at an angle the corners will line up with pads designed for the ERA.

Noise figure=2.4 dB, current=35 mA, gain=21 dB, P1dB=11 dB, and both input and output return losses exceed 25 dB. Unless OIP3 is a big concern, it could even be operated at 28 mA, lowering P1dB to 8 dB, without much change to other characteristics. (The data sheet itself doesn't contain much of this info; you have to click Download Graphs.)

Using your present SAW design, this would give a net 3 dB gain for the filter module. Or that extra gain could be sacrificed with a pad on the amp output, for additional protection of the SAW.

I researched some low noise amps, and the cost of reducing the noise figure by 1.5-2 dB seems high: large current draw, horrible return losses (which might affect the filter performance), and high P1dB levels which could zap the SAW. Not to mention 3 mm packages with four leads on a side.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Scotty
> MAAL-010570 might be a new part, and the datasheet is not published yet. I can email it to you tomorrow. The downside is that its footprint is different from EAR-33+.
>
> With the SAW filters, I was wondering if the maximum power at MSA input could get about 7dB worse. The maximum power is limited by the final RBW crystal filter, i.e. we do not want to overload the crystal filter. The power at crystal filter input would be 0dBm (or so). If we increase 7dB gain (it was -7dB with cavity filter, now we change to 0dB with SAW) in the FE path, that means we have to drop the maximum input power by 7dB. If the original dynamic range is -6dBm to -110dBm , with the SAW replacement, the dynamic range could change to
> -13dBm to -107.5dBm, this is still my guess, need to verify with test. -13dBm may not a bad number for home made SA.
>
> A possible way that we make the dynamic range a little bit better could be that we put 10.7MHz, 1 (or 2) MHz BW BPF at outputs of IFA to suppress the noise level out band, in this way, we hope the total noise power arrives at crystal filter can be a little bit lower.
>
> The IFAs have LPF at output, the BW might be around 40MHz (if I remember correctly), it is a little bit wide. If we can put a ceramic 1MHz BPF noise filter (or the widest RBW filter) between IFA1 and IFA2, I would expect the noise floor between 0-40MHz at crystal filter input would drop a lot. As the input level at new added BPF input is 18dB lower than

the final crystal filter, it won't be overloaded. Maybe we can put one more this kind of filter between mixer 2 output and IFA1 input to see if it helps. Again, this is just some brain storming, I did not test them.
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> >
> > Lin,
> > I cannot find the MAAL-010570. Do you mean the MAAL-010705? This would require a redesign of the board.
> > In the present design there are provisions to add a 2 dB pad between the amplifier and following SAW filter. The total noise presented to the input of Mixer 2 would be the same as using the cavity filter. The replacement modules would then have a gain of -2 dB.
> > Â This would still be a total MSA gain improvement over the Cavity filter, but with the same noise level.
> > Â There are several schemes to use here. Experementation is fun.
> > Scotty
> >
> > --- On Sat, 12/10/11, inlinebeginner <inlinebeginner@> wrote:
> >
> > From: inlinebeginner <inlinebeginner@>
> > Subject: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Saturday, December 10, 2011, 10:57 PM
> >

8882. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-11 20:40:47 UTC
From: cees
Topic: 8774 Message: 8882

Hi Neal,

Please add me to your list for 1 set and if possible also for the amplifier ERA 33.

Thanks

Cees, PE1FBZ

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> All,
>
> Let me start out with the bottom line. With a lot of help from Scotty, I put together a working prototype of a 1013 MHz SAW based filter that can be used in place of the Cavity Filter that is currently in the MSA. The resulting filter has 100 dB of ultimate rejection, >90 dB of rejection at the MSA second mixer's image frequency (around 1034 MHz), and has near 0 dB insertion loss (contains an amplifier). The PCB footprint is equivalent to one SLIM size board (1.2" x 1.2").
>
> A few months ago I started looking at building another MSA and wanted to reduce its size as much as possible. The Cavity Filter is obviously a big factor in the MSA's size. I decided to try and duplicate the Cavity Filter's function utilizing a SAW based design. I found a source for a SAW from a company in England (Gooledge) that looked like it would be perfect for the job. I put together a design and PCB layout and approached Scotty with the idea. Scotty altered my design and layouts, and we iterated the design through a couple of cycles. The resulting performance we obtained turned out to be excellent.
>
> I created a file folder called "1013 MHz SAW Filter"
>
> http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/
>
> on the group page for you all to look at. The folder contains various frequency responses, pictures of the PCB, and construction stage photos. I also included a data sheet for the SAW that was used. Basically, the design consists of three cascaded SAWs, a few PADs and an ERA-33 amplifier. If you look at the group file, you will get a good idea of the approach and performance.
>
> I am curious if there would be any interest out there for putting together some sort of group buy for this filter. A group buy would be for the SAWs (three required/filter-I paid $5.75/each ordering in small quantity), a PCB (>$5.00/each), plus shipping. The quantity we order will obviously drive the SAW cost. The rest of the parts needed to complete the assembly (caps, resistors, connectors,etc.) are very similar to the MSA's current IF ERA-33SM based amplifier. If there is enough interest, I would be willing to facilitate the group buy of the SAWs and PCBs.
>
> Before we formally begin a group buy, those of you out there with interest please post a

response so we can get an idea of what quantities we may be talking about. BTW, Scotty is considering adding this to the formal SLIM list. He is working on putting the PCB layout, schematic and parts lists in the form consistent with what he uses for SLIMs.
>
> Neal
>

8883. 2 TUBE COAX CAVITY FILTER : ON SALE NOW.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-11 23:27:59 UTC
From: Len
Topic: 8883 Message: 8883

Hello Group

When all the dust settles on the SAW design I will happily make 1-2-3-4 TUBE Coax cavity filters

What a win-win situation!

Provisional price; 2 TUBE KIT: U$28, Assembled and tested U$48.

Plus about U$15 postage from Perth Australia.

I assume these are still at 1.013 GHz ??

Other frequencies +/- 30% should be easy to do.

I am also assuming a simple linear scaling in all lengths? Including the coupling loop height?

Can a guru tell me this is true or not?

I am making a custom 4 tube at 1.0453 GHz, all the lengths cut ~3% shorter.

I will be testing it out tonight. I will report what the tunable range with the screws is.

Regards

Len Spyker

8884. Cavity replacement

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-12 01:29:07 UTC
From: Sam
Topic: 8884 Message: 8884

My suggested replacement of the cavity filter is posted here:
<http://xkcd.com/730>

Sam W.

8885. Re: [spectrumanalyzer] 2 TUBE COAX CAVITY FILTER : ON SALE NOW.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-12 01:34:01 UTC
From: william sprowls
Topic: 8883 Message: 8885

Hi Len,
 Linear scaling of the stub lengths is certain. As frequencies go higher, the outside cavity length can be reduced, but you will not see any affect.
 Scaling the hairpins would be logical. However, this area is really more voodoo that science.
Scotty

--- On Sun, 12/11/11, Len <redmond2@...> wrote:

From: Len <redmond2@...>
Subject: [spectrumanalyzer] 2 TUBE COAX CAVITY FILTER : ON SALE NOW.
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, December 11, 2011, 5:27 PM

Hello Group When all the dust settles on the SAW design I will happily make 1-2-3-4 TUBE Coax cavity filtersWhat a win-win situation! Provisional price; 2 TUBE KIT: U$28, Assembled and tested U$48. Plus about U$15 postage from Perth Australia. I assume these are still at 1.013 GHz ?? Other frequencies +/- 30% should be easy to do. I am also assuming a simple linear scaling in all lengths? Including the coupling loop height?Can a guru tell me this is true or not? I am making a custom 4 tube at 1.0453 GHz, all the lengths cut ~3% shorter. I will be testing it out tonight. I will report what the tunable range with the screws is. RegardsLen Spyker

8886. Re: [spectrumanalyzer] Cavity replacement

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-12 03:02:49 UTC
From: Jim Hontoria
Topic: 8884 Message: 8886

Wow!
How 'bout the pcb?
Jim, W1JGH

On Sun, Dec 11, 2011 at 8:29 PM, Sam <swetterlin@...> wrote:

> **
>
>
> My suggested replacement of the cavity filter is posted here:
> <http://xkcd.com/730>
>
> Sam W.
>
>
>

--
Jim G. Hontoria

8887. Re: [spectrumanalyzer] Cavity replacement

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-12 03:12:08 UTC
From: Amos Ku
Topic: 8884 Message: 8887

Nice idea!

Have kit for sale somewhere?

A.K.

From: Sam <swetterlin@...>
To: spectrumanalyzer@yahoogroups.com
Sent: Sunday, December 11, 2011 5:29 PM
Subject: [spectrumanalyzer] Cavity replacement

My suggested replacement of the cavity filter is posted here:
<http://xkcd.com/730>

Sam W.

8888. Amp+Cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-12 15:34:27 UTC
From: Sam
Topic: 8888 Message: 8888

Here's an idea for significantly reducing the noise floor of an existing MSA. Use the SAW+amp module (but without the input pad) ahead of your cavity filter. The cavity output will be increased enough that the noise of the existing IF2 amp drops out of the equation, to be replaced by the identical noise of the amp in the SAW module. If your cavity filter and Mixer 2 each have 6 dB loss, you will be moving the amp 9 dB (12-SAW loss) up the signal chain and will get approximately 9 dB of noise improvement. (Noise reduction will also depend on how much noise comes out of Mixer 1.)

The SAW filter in this case is serving merely to eliminate strong signals far from 1013 MHz so IMD doesn't create an in-band signal; the cavity filter does the serious filtering. Thus, the profile of the SAW response is not very critical, which is why I think the input pad is likely not needed. Alternatively, you could keep the input pad, dropping 3 dB of the noise improvement. In that case, you would likely get by with a 3-cavity filter.

But if you already have the cavity filter, just adding the SAW+Amp in front of it is a simple modification.

I don't think this will increase dynamic range, because what you gain at the bottom you will lose at the top. But this would be particularly handy for VNA use, where you usually don't encounter input signals higher than the TG signal (and if you do you can easily attenuate them), so the very top end is not used. Or for SA use when looking for weak signals.

On top of the noise improvement, this should reduce all spurs other than those created by leakage through the cavity filter, by boosting the level of actual signals.

Neal or Scotty, maybe you could give this a try.

An alternative to this is to use two 2-cavity filters with the amp between them. I believe this would be much easier to build and tune than a 4-cavity filter.

Sam W.

8889. Re: Amp+Cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-12 15:38:22 UTC
From: Sam
Topic: 8888 Message: 8889

P.S. This probably also requires that you reduce the gain of the IF2 amp, perhaps by simply bypassing half of it.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Here's an idea for significantly reducing the noise floor of an existing MSA. Use the SAW+amp module (but without the input pad) ahead of your cavity filter. The cavity output will be increased enough that the noise of the existing IF2 amp drops out of the equation, to be replaced by the identical noise of the amp in the SAW module. If your cavity filter and Mixer 2 each have 6 dB loss, you will be moving the amp 9 dB (12-SAW loss) up the signal chain and will get approximately 9 dB of noise improvement. (Noise reduction will also depend on how much noise comes out of Mixer 1.)
>
> The SAW filter in this case is serving merely to eliminate strong signals far from 1013 MHz so IMD doesn't create an in-band signal; the cavity filter does the serious filtering. Thus, the profile of the SAW response is not very critical, which is why I think the input pad is likely not needed. Alternatively, you could keep the input pad, dropping 3 dB of the noise improvement. In that case, you would likely get by with a 3-cavity filter.
>
> But if you already have the cavity filter, just adding the SAW+Amp in front of it is a simple modification.
>
> I don't think this will increase dynamic range, because what you gain at the bottom you will lose at the top. But this would be particularly handy for VNA use, where you usually don't encounter input signals higher than the TG signal (and if you do you can easily attenuate them), so the very top end is not used. Or for SA use when looking for weak signals.
>
> On top of the noise improvement, this should reduce all spurs other than those created by leakage through the cavity filter, by boosting the level of actual signals.
>
> Neal or Scotty, maybe you could give this a try.
>
> An alternative to this is to use two 2-cavity filters with the amp between them. I believe this would be much easier to build and tune than a 4-cavity filter.
>
> Sam W.
>

8890. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-12 16:08:36 UTC
From: inlinebeginner
Topic: 8774 Message: 8890

Scotty
The original cavity filter has -7.1dB gain, and 7.1dB NF. To replace the cavity fitler with SAW, we need to create similar gain and NF to not change the dynamic range and noise floor significantly. As we use amplifier ERA-33+, we introduce noise into the system, therefore, the noise figure will be worst (means greater) than 7.1dB, if we want to keep a gain as -7.1dB.
Under the constrain of gain -7.1dB, try to minimize NF, here is what I got:

SAW + EAR33 + SAW + 8.4dB pad, +SAW +8.4dB pad

This will give us -7.1dB gain and 9.3dB NF. This means the noise floor will increase about 2dB, or dynamic range losses 2dB at bottom, which is not a significant change from the original design.

If we use MA-COM LNA,

SAW + MAAL010570 + SAW + 8.4dB pad, +SAW +8.4dB pad

we can get -7.1dB gain and 7.44dB NF. I don't think we care the difference for a 0.34dB noise floor increase.

Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Scotty,
> Here is a nice compromise amp: the Minicircuits LEE-39. It's a 3 mm square package with leads at the corners, but it appears that if you place it at an angle the corners will line up with pads designed for the ERA.
>
> Noise figure=2.4 dB, current=35 mA, gain=21 dB, P1dB=11 dB, and both input and output return losses exceed 25 dB. Unless OIP3 is a big concern, it could even be operated at 28 mA, lowering P1dB to 8 dB, without much change to other characteristics. (The data sheet itself doesn't contain much of this info; you have to click Download Graphs.)
>
> Using your present SAW design, this would give a net 3 dB gain for the filter module. Or that extra gain could be sacrificed with a pad on the amp output, for additional protection of the SAW.
>
> I researched some low noise amps, and the cost of reducing the noise figure by 1.5-2 dB seems high: large current draw, horrible return losses (which might affect the filter performance), and high P1dB levels which could zap the SAW. Not to mention 3 mm packages with four leads on a side.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:

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> > Scotty
> > MAAL-010570 might be a new part, and the datasheet is not published yet. I can email it to you tomorrow. The downside is that its footprint is different from EAR-33+.
> >
> > With the SAW filters, I was wondering if the maximum power at MSA input could get about 7dB worse. The maximum power is limited by the final RBW crystal filter, i.e. we do not want to overload the crystal filter. The power at crystal filter input would be 0dBm (or so). If we increase 7dB gain (it was -7dB with cavity filter, now we change to 0dB with SAW) in the FE path, that means we have to drop the maximum input power by 7dB. If the original dynamic range is -6dBm to -110dBm , with the SAW replacement, the dynamic range could change to
> > -13dBm to -107.5dBm, this is still my guess, need to verify with test. -13dBm may not a bad number for home made SA.
> >
> > A possible way that we make the dynamic range a little bit better could be that we put 10.7MHz, 1 (or 2) MHz BW BPF at outputs of IFA to suppress the noise level out band, in this way, we hope the total noise power arrives at crystal filter can be a little bit lower.
> >
> > The IFAs have LPF at output, the BW might be around 40MHz (if I remember correctly), it is a little bit wide. If we can put a ceramic 1MHz BPF noise filter (or the widest RBW filter) between IFA1 and IFA2, I would expect the noise floor between 0-40MHz at crystal filter input would drop a lot. As the input level at new added BPF input is 18dB lower than the final crystal filter, it won't be overloaded. Maybe we can put one more this kind of filter between mixer 2 output and IFA1 input to see if it helps. Again, this is just some brain storming, I did not test them.
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > >
> > > Lin,
> > > I cannot find the MAAL-010570. Do you mean the MAAL-010705? This would require a redesign of the board.
> > > In the present design there are provisions to add a 2 dB pad between the amplifier and following SAW filter. The total noise presented to the input of Mixer 2 would be the same as using the cavity filter. The replacement modules would then have a gain of -2 dB.
> > > Â This would still be a total MSA gain improvement over the Cavity filter, but with the same noise level.
> > > Â There are several schemes to use here. Experementation is fun.
> > > Scotty
> > >
> > > --- On Sat, 12/10/11, inlinebeginner <inlinebeginner@> wrote:
> > >
> > > From: inlinebeginner <inlinebeginner@>
> > > Subject: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
> > > To: spectrumanalyzer@yahoogroups.com
> > > Date: Saturday, December 10, 2011, 10:57 PM
> > >

>

8891. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-12 17:11:29 UTC
From: Sam
Topic: 8774 Message: 8891

There is no need to put an extra pad in the SAW module just to keep the noise floor the same. A lower noise floor is good. While it shifts the dynamic range downward, you can always move it back up if you want by adding an attenuator on the MSA input.

It would be a simple matter to look at what happens to the noise floor when the SAW module is put in place. I have limited faith in noise calculations.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Scotty
> The original cavity filter has -7.1dB gain, and 7.1dB NF. To replace the cavity fitler with SAW, we need to create similar gain and NF to not change the dynamic range and noise floor significantly. As we use amplifier ERA-33+, we introduce noise into the system, therefore, the noise figure will be worst (means greater) than 7.1dB, if we want to keep a gain as -7.1dB.
> Under the constrain of gain -7.1dB, try to minimize NF, here is what I got:
>
> SAW + EAR33 + SAW + 8.4dB pad, +SAW +8.4dB pad
>
> This will give us -7.1dB gain and 9.3dB NF. This means the noise floor will increase about 2dB, or dynamic range losses 2dB at bottom, which is not a significant change from the original design.
>
> If we use MA-COM LNA,
>
> SAW + MAAL010570 + SAW + 8.4dB pad, +SAW +8.4dB pad
>
> we can get -7.1dB gain and 7.44dB NF. I don't think we care the difference for a 0.34dB noise floor increase.
>
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Scotty,
> > Here is a nice compromise amp: the Minicircuits LEE-39. It's a 3 mm square package with leads at the corners, but it appears that if you place it at an angle the corners will line up with pads designed for the ERA.
> >
> > Noise figure=2.4 dB, current=35 mA, gain=21 dB, P1dB=11 dB, and both input and output return losses exceed 25 dB. Unless OIP3 is a big concern, it could even be operated at 28 mA, lowering P1dB to 8 dB, without much change to other characteristics. (The data sheet itself doesn't contain much of this info; you have to click Download Graphs.)
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> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > >
> > > Scotty
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> > > > --- On Sat, 12/10/11, inlinebeginner <inlinebeginner@> wrote:
> > > >
> > > > From: inlinebeginner <inlinebeginner@>
> > > > Subject: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
> > > > To: spectrumanalyzer@yahoogroups.com
> > > > Date: Saturday, December 10, 2011, 10:57 PM
> > > >
> >
>

8892. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-12 18:01:35 UTC
From: inlinebeginner
Topic: 8774 Message: 8892

Sam
If we put the pad at amplifier input (or MSA input), the overal noise figure will get worse.
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--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
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>

8893. Re: Cavity replacement

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-12 19:16:19 UTC
From: Rex Pearson
Topic: 8884 Message: 8893

Built it last night, skirts are not as good as Scotty's but it works well,
now all I need to do it fit it in the box

8894. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-12 19:43:56 UTC
From: Sam
Topic: 8774 Message: 8894

If you want to add some attenuation to avoid maxing out on the high end, I think the place to do it is the IF2 amp, not the SAW amp. That way you keep the signal level higher at the IF2 amp input.

In any case, I think the way to proceed is to install the SAW module as designed, see what noise floor and high end you get, and tinker from there.

Sam W.

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8895. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-12 20:19:44 UTC
From: inlinebeginner
Topic: 8774 Message: 8895

The best place for this 7.1 dB attenuator should be right at crystal filter RBW input, because the gain of IF1 and IF2 will help to get beter overall noise figure.
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8896. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-12 22:57:42 UTC
From: Sam
Topic: 8774 Message: 8896

The attenuator needs to be late in the amplification chain, but not so late that an amplifier gets overloaded. I think the perfect place would be between the two halves of the IF2 amp.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
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> > > > > > Noise figure=2.4 dB, current=35 mA, gain=21 dB, P1dB=11 dB, and both input and output return losses exceed 25 dB. Unless OIP3 is a big concern, it could even be operated at 28 mA, lowering P1dB to 8 dB, without much change to other characteristics. (The data sheet itself doesn't contain much of this info; you have to click Download Graphs.)
> > > > > >
> > > > > > Using your present SAW design, this would give a net 3 dB gain for the filter module. Or that extra gain could be sacrificed with a pad on the amp output, for additional protection of the SAW.
> > > > > >
> > > > > > I researched some low noise amps, and the cost of reducing the noise figure by 1.5-2 dB seems high: large current draw, horrible return losses (which might affect the filter performance), and high P1dB levels which could zap the SAW. Not to mention 3 mm packages with four leads on a side.
> > > > > >
> > > > > > Sam W.
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > >
> > > > > > > Scotty
> > > > > > > MAAL-010570 might be a new part, and the datasheet is not published yet. I can email it to you tomorrow. The downside is that its footprint is different from EAR-33+.
> > > > > > >
> > > > > > > With the SAW filters, I was wondering if the maximum power at MSA input could get about 7dB worse. The maximum power is limited by the final RBW crystal filter, i.e. we

do not want to overload the crystal filter. The power at crystal filter input would be 0dBm (or so). If we increase 7dB gain (it was -7dB with cavity filter, now we change to 0dB with SAW) in the FE path, that means we have to drop the maximum input power by 7dB. If the original dynamic range is -6dBm to -110dBm , with the SAW replacement, the dynamic range could change to
> > > > > > > -13dBm to -107.5dBm, this is still my guess, need to verify with test. -13dBm may not a bad number for home made SA.
> > > > > > >
> > > > > > > A possible way that we make the dynamic range a little bit better could be that we put 10.7MHz, 1 (or 2) MHz BW BPF at outputs of IFA to suppress the noise level out band, in this way, we hope the total noise power arrives at crystal filter can be a little bit lower.
> > > > > > >
> > > > > > > The IFAs have LPF at output, the BW might be around 40MHz (if I remember correctly), it is a little bit wide. If we can put a ceramic 1MHz BPF noise filter (or the widest RBW filter) between IFA1 and IFA2, I would expect the noise floor between 0-40MHz at crystal filter input would drop a lot. As the input level at new added BPF input is 18dB lower than the final crystal filter, it won't be overloaded. Maybe we can put one more this kind of filter between mixer 2 output and IFA1 input to see if it helps. Again, this is just some brain storming, I did not test them.
> > > > > > > Lin
> > > > > > >
> > > > > > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > > > > > > >
> > > > > > > > Lin,
> > > > > > > > I cannot find the MAAL-010570. Do you mean the MAAL-010705? This would require a redesign of the board.
> > > > > > > > In the present design there are provisions to add a 2 dB pad between the amplifier and following SAW filter. The total noise presented to the input of Mixer 2 would be the same as using the cavity filter. The replacement modules would then have a gain of -2 dB.
> > > > > > > > Â This would still be a total MSA gain improvement over the Cavity filter, but with the same noise level.
> > > > > > > > Â There are several schemes to use here. Experementation is fun.
> > > > > > > > Scotty
> > > > > > > >
> > > > > > > > --- On Sat, 12/10/11, inlinebeginner <inlinebeginner@> wrote:
> > > > > > > >
> > > > > > > > From: inlinebeginner <inlinebeginner@>
> > > > > > > > Subject: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
> > > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > > Date: Saturday, December 10, 2011, 10:57 PM
> > > > > > > >
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8897. 1.0453 GHz Coax filter results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 02:41:00 UTC
From: Len
Topic: 8897 Message: 8897

Hello Group

All the 1.0453 GHz parts lengths were shortened by 3% (up 32 MHz) from the normal 1.013 GHz standard sizes.

This is based on my assumption of linear scaling.

I can tune the 4 tube 1.0453 GHz Coax cavity filter up to 1.054 GHz and down to 0.990 GHz while still working properly

Up 9 MHz and down 55 MHz seems to me the inner post length is still a bit too long.

I am not sure if the tuning Center Point is supposed to be at 1.0453 GHz or not.

Whether having less tuning screw stub poking inside the cavity is a good thing or not?

If there is a next time I will shorten them another 2%. The old suck it and see method.

Regards

Len Spyker

8898. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 03:16:00 UTC
From: inlinebeginner
Topic: 8774 Message: 8898

Here is the updated calculation:
1) SAW + EAR33 + 4.7dB pad + SAW + 3dB pad, +SAW
2) Put a 9 dB pad between IFA1 and IFA2
In this way, the maximum power level at MSA input will be same, while the noise floor will drop about 6.8dB. This means the dynamic range is increased with the SAW filters.

Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> The attenuator needs to be late in the amplification chain, but not so late that an amplifier gets overloaded. I think the perfect place would be between the two halves of the IF2 amp.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > The best place for this 7.1 dB attenuator should be right at crystal filter RBW input, because the gain of IF1 and IF2 will help to get beter overall noise figure.
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > If you want to add some attenuation to avoid maxing out on the high end, I think the place to do it is the IF2 amp, not the SAW amp. That way you keep the signal level higher at the IF2 amp input.
> > >
> > > In any case, I think the way to proceed is to install the SAW module as designed, see what noise floor and high end you get, and tinker from there.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > >
> > > > Sam
> > > > If we put the pad at amplifier input (or MSA input), the overal noise figure will get worse.
> > > > Lin
> > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > >
> > > > > There is no need to put an extra pad in the SAW module just to keep the noise floor the same. A lower noise floor is good. While it shifts the dynamic range downward, you can always move it back up if you want by adding an attenuator on the MSA input.
> > > > >
> > > > > It would be a simple matter to look at what happens to the noise floor when the

SAW module is put in place. I have limited faith in noise calculations.
> > > > >
> > > > > Sam W.
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@>
wrote:
> > > > > >
> > > > > > Scotty
> > > > > > The original cavity filter has -7.1dB gain, and 7.1dB NF. To replace the cavity
fitler with SAW, we need to create similar gain and NF to not change the dynamic range and
noise floor significantly. As we use amplifier ERA-33+, we introduce noise into the system,
therefore, the noise figure will be worst (means greater) than 7.1dB, if we want to keep a
gain as -7.1dB.
> > > > > > Under the constrain of gain -7.1dB, try to minimize NF, here is what I got:
> > > > > >
> > > > > > SAW + EAR33 + SAW + 8.4dB pad, +SAW +8.4dB pad
> > > > > >
> > > > > > This will give us -7.1dB gain and 9.3dB NF. This means the noise floor will
increase about 2dB, or dynamic range losses 2dB at bottom, which is not a significant
change from the original design.
> > > > > >
> > > > > > If we use MA-COM LNA,
> > > > > >
> > > > > > SAW + MAAL010570 + SAW + 8.4dB pad, +SAW +8.4dB pad
> > > > > >
> > > > > > we can get -7.1dB gain and 7.44dB NF. I don't think we care the difference for
a 0.34dB noise floor increase.
> > > > > >
> > > > > > Lin
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > >
> > > > > > > Scotty,
> > > > > > > Here is a nice compromise amp: the Minicircuits LEE-39. It's a 3 mm square
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corners will line up with pads designed for the ERA.
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> > > > > > > Using your present SAW design, this would give a net 3 dB gain for the filter
module. Or that extra gain could be sacrificed with a pad on the amp output, for additional
protection of the SAW.
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> > > > > > > I researched some low noise amps, and the cost of reducing the noise figure
by 1.5-2 dB seems high: large current draw, horrible return losses (which might affect the
filter performance), and high P1dB levels which could zap the SAW. Not to mention 3 mm
packages with four leads on a side.

> > > > > > >
> > > > > > > Sam W.
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> > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
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> > > > > > > > > MAAL-010570 might be a new part, and the datasheet is not published yet. I can email it to you tomorrow. The downside is that its footprint is different from EAR-33+.
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> > > > > > > > > With the SAW filters, I was wondering if the maximum power at MSA input could get about 7dB worse. The maximum power is limited by the final RBW crystal filter, i.e. we do not want to overload the crystal filter. The power at crystal filter input would be 0dBm (or so). If we increase 7dB gain (it was -7dB with cavity filter, now we change to 0dB with SAW) in the FE path, that means we have to drop the maximum input power by 7dB. If the original dynamic range is -6dBm to -110dBm , with the SAW replacement, the dynamic range could change to
> > > > > > > > -13dBm to -107.5dBm, this is still my guess, need to verify with test. -13dBm may not a bad number for home made SA.
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> > > > > > > > > A possible way that we make the dynamic range a little bit better could be that we put 10.7MHz, 1 (or 2) MHz BW BPF at outputs of IFA to suppress the noise level out band, in this way, we hope the total noise power arrives at crystal filter can be a little bit lower.
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> > > > > > > > > The IFAs have LPF at output, the BW might be around 40MHz (if I remember correctly), it is a little bit wide. If we can put a ceramic 1MHz BPF noise filter (or the widest RBW filter) between IFA1 and IFA2, I would expect the noise floor between 0-40MHz at crystal filter input would drop a lot. As the input level at new added BPF input is 18dB lower than the final crystal filter, it won't be overloaded. Maybe we can put one more this kind of filter between mixer 2 output and IFA1 input to see if it helps. Again, this is just some brain storming, I did not test them.
> > > > > > > > Lin
> > > > > > > >
> > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > > > > > > > >
> > > > > > > > > > Lin,
> > > > > > > > > > I cannot find the MAAL-010570. Do you mean the MAAL-010705? This would require a redesign of the board.
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> > > > > > > > > >
> > > > > > > > > > > --- On Sat, 12/10/11, inlinebeginner <inlinebeginner@> wrote:
> > > > > > > > > >

> > > > > > > > > From: inlinebeginner <inlinebeginner@>
> > > > > > > > > Subject: [spectrumanalyzer] Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter
> > > > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > > > Date: Saturday, December 10, 2011, 10:57 PM
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8899. Re: [spectrumanalyzer] 1.0453 GHz Coax filter results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 04:58:07 UTC
From: william sprowls
Topic: 8897 Message: 8899

Hi Len and All,
"Whether having less tuning screw stub poking inside the cavity is a good thing or not?"

A Coaxial Cavity Filter without a tuning screw will exhibit slightly less insertion loss and narrower bandwidth (higher Q). It will also be less susceptible to temperature changes (tuning drift). So for best performance, the stubs need to be just a tiny bit shorter than the electrical length so that only a very small amount of tuning screw (end capacitance) is needed to tune it true.
Harold built his without any tuning screws. He threaded the stubs and tuned by changing the internal length of the stubs.

--- On Mon, 12/12/11, Len <redmond2@...> wrote:

From: Len <redmond2@...>
Subject: [spectrumanalyzer] 1.0453 GHz Coax filter results
To: spectrumanalyzer@yahoogroups.com
Date: Monday, December 12, 2011, 8:41 PM

Hello Group All the 1.0453 GHz parts lengths were shortened by 3% (up 32 MHz) from the normal 1.013 GHz standard sizes.This is based on my assumption of linear scaling. I can tune the 4 tube 1.0453 GHz Coax cavity filter up to 1.054 GHz and down to 0.990 GHz while still working properlyUp 9 MHz and down 55 MHz seems to me the inner post length is still a bit too long. I am not sure if the tuning Center Point is supposed to be at 1.0453 GHz or not.Whether having less tuning screw stub poking inside the cavity is a good thing or not?
If there is a next time I will shorten them another 2%. The old suck it and see method.RegardsLen Spyker

8900. Re: Amp+Cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 05:55:45 UTC
From: inlinebeginner
Topic: 8888 Message: 8900

If we can change to the following configuration, we can get 0dBm to -114dBm dynamic range, with very good linearity.

1) SAW (can be replaced with 1-pipe cavity) + ERA 33 + 4-Pipe Cavity
2) Set IFA1 gain = 7.4dB,
3) Move IFA2 to the place between RBW filters and log detector, and add a widest RBW as noise filter at its output.

The overall (from MSA input to log detect input) gain will be 15dB, overall NF=15.5dB. MSA input range: 0dBm to -114dBm
calculated noise floor: -114dBm

The linearity from 0dBm to -10dBm will be very good.
Below -105dBm, the log detector has some non-linearity (That area is between -90dBm to -100dBm on log detector's V_dB curve, which is still useful).

Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> P.S. This probably also requires that you reduce the gain of the IF2 amp, perhaps by simply bypassing half of it.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Here's an idea for significantly reducing the noise floor of an existing MSA. Use the SAW+amp module (but without the input pad) ahead of your cavity filter. The cavity output will be increased enough that the noise of the existing IF2 amp drops out of the equation, to be replaced by the identical noise of the amp in the SAW module. If your cavity filter and Mixer 2 each have 6 dB loss, you will be moving the amp 9 dB (12-SAW loss) up the signal chain and will get approximately 9 dB of noise improvement. (Noise reduction will also depend on how much noise comes out of Mixer 1.)
> >
> > The SAW filter in this case is serving merely to eliminate strong signals far from 1013 MHz so IMD doesn't create an in-band signal; the cavity filter does the serious filtering. Thus, the profile of the SAW response is not very critical, which is why I think the input pad is likely not needed. Alternatively, you could keep the input pad, dropping 3 dB of the noise improvement. In that case, you would likely get by with a 3-cavity filter.
> >
> > But if you already have the cavity filter, just adding the SAW+Amp in front of it is a simple modification.
> >
> > I don't think this will increase dynamic range, because what you gain at the bottom you will lose at the top. But this would be particularly handy for VNA use, where you usually don't encounter input signals higher than the TG signal (and if you do you can easily

attenuate them), so the very top end is not used. Or for SA use when looking for weak signals.
> >
> > On top of the noise improvement, this should reduce all spurs other than those created by leakage through the cavity filter, by boosting the level of actual signals.
> >
> > Neal or Scotty, maybe you could give this a try.
> >
> > An alternative to this is to use two 2-cavity filters with the amp between them. I believe this would be much easier to build and tune than a 4-cavity filter.
> >
> > Sam W.
> >
>

8901. Re: 1.0453 GHz Coax filter results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 06:01:35 UTC
From: inlinebeginner
Topic: 8897 Message: 8901

Scotty
I tried without top tuning screw and just used a long screw as stub tune from bottom, it works well. In theory, this would get highest Q, and best rejection at 1034MHz. Also, the cavity filter will become a tuneable filter, can work from 970MHz to 2.1GHz.
Lin

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Len and All,
> Â "Whether having Â less tuning screw stub poking inside the cavity is a good thing or not?"
>
> Â A Coaxial Cavity Filter without a tuning screw will exhibit slightly less insertion loss and narrower bandwidth (higher Q). It will also be less susceptible to temperature changes (tuning drift). So for best performance, the stubs need to be just a tiny bit shorter than the electrical length so that only a very small amount of tuning screw (end capacitance) is needed to tune it true.
> Â Harold built his without any tuning screws. He threaded the stubs and tuned by changing the internal length of the stubs.
>
> --- On Mon, 12/12/11, Len <redmond2@...> wrote:
>
> From: Len <redmond2@...>
> Subject: [spectrumanalyzer] 1.0453 GHz Coax filter results
> To: spectrumanalyzer@yahoogroups.com
> Date: Monday, December 12, 2011, 8:41 PM
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>

8902. Re: [spectrumanalyzer] 1.0453 GHz Coax filter results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 07:43:14 UTC
From: w4zcb
Topic: 8897 Message: 8902

Hi Scotty. Yup, the threaded stub was cool, but for "fineness" of tuning, I had to use a 1/4 x 36 tap and die, and the lock nut had to be really honked down. The bottom of the stub is REALLY the high current point! Silver soldered after getting it right made a fair sized improvement.

Regards

W4ZCB

Hi Len and All,
"Whether having less tuning screw stub poking inside the cavity is a good thing or not?"

A Coaxial Cavity Filter without a tuning screw will exhibit slightly less insertion loss and narrower bandwidth (higher Q). It will also be less susceptible to temperature changes (tuning drift). So for best performance, the stubs need to be just a tiny bit shorter than the electrical length so that only a very small amount of tuning screw (end capacitance) is needed to tune it true.
Harold built his without any tuning screws. He threaded the stubs and tuned by changing the internal length of the stubs.

--- On Mon, 12/12/11, Len <redmond2@...> wrote:

From: Len <redmond2@...>
Subject: [spectrumanalyzer] 1.0453 GHz Coax filter results
To: spectrumanalyzer@yahoogroups.com
Date: Monday, December 12, 2011, 8:41 PM

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8903. Re: 1.0453 GHz Coax filter results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 14:51:44 UTC
From: Sam
Topic: 8897 Message: 8903

Lin,
So your entire stub was threaded? Interesting.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Scotty
> I tried without top tuning screw and just used a long screw as stub tune from bottom, it works well. In theory, this would get highest Q, and best rejection at 1034MHz. Also, the cavity filter will become a tuneable filter, can work from 970MHz to 2.1GHz.
> Lin
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> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
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>

8904. Re: 1.0453 GHz Coax filter results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 15:20:59 UTC
From: inlinebeginner
Topic: 8897 Message: 8904

Sam
Yes. The entire stub was threded. Works very well. You might remember that day I asked you about if we can change this cavity filter to a band stop filter. After that, I spent some time to think about this filter, and eventually, I figured out how it works. Base on how it works, I found if we change the stub to threaded, it will be a tuneable filter. The insertion loss will not change from 970MHz to 2.1GHz, from what I tested with a 1-pipe cavity filter.
Based on what I figured out, there are some other change we can do, such as we can make this filter length shorter (cut to half), or we can also tune to 500MHz with the original Length....
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Lin,
> So your entire stub was threaded? Interesting.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Scotty
> > I tried without top tuning screw and just used a long screw as stub tune from bottom, it works well. In theory, this would get highest Q, and best rejection at 1034MHz. Also, the cavity filter will become a tuneable filter, can work from 970MHz to 2.1GHz.
> > Lin
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> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
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> > >
> > > From: Len <redmond2@>
> > > Subject: [spectrumanalyzer] 1.0453 GHz Coax filter results

> > > To: spectrumanalyzer@yahoogroups.com
> > > Date: Monday, December 12, 2011, 8:41 PM
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8905. Re: [spectrumanalyzer] Re: 1.0453 GHz Coax filter results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 15:50:38 UTC
From: Jurgen
Topic: 8897 Message: 8905

I would have assumed that the thread would introduce considerable
surface field non-linearity and as such reduce the filter Q.

Jurgen

On 12/13/2011 10:20 AM, inlinebeginner wrote:
>
> Sam
> Yes. The entire stub was threded. Works very well. You might remember
> that day I asked you about if we can change this cavity filter to a
> band stop filter. After that, I spent some time to think about this
> filter, and eventually, I figured out how it works. Base on how it
> works, I found if we change the stub to threaded, it will be a
> tuneable filter. The insertion loss will not change from 970MHz to
> 2.1GHz, from what I tested with a 1-pipe cavity filter.
> Based on what I figured out, there are some other change we can do,
> such as we can make this filter length shorter (cut to half), or we
> can also tune to 500MHz with the original Length....
> Lin
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> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@...> wrote:
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> > Lin,
> > So your entire stub was threaded? Interesting.
> > Sam W.
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> > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner"
> <inlinebeginner@> wrote:
> > >
> > > Scotty
> > > I tried without top tuning screw and just used a long screw as
> stub tune from bottom, it works well. In theory, this would get
> highest Q, and best rejection at 1034MHz. Also, the cavity filter will
> become a tuneable filter, can work from 970MHz to 2.1GHz.
> > > Lin
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> > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, william sprowls
> <wsprowls@> wrote:
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> > > > Hi Len and All,
> > > > ? "Whether having ? less tuning screw stub poking inside the

> cavity is a good thing or not?"
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> slightly less insertion loss and narrower bandwidth (higher Q). It
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> So for best performance, the stubs need to be just a tiny bit shorter
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8906. Re: [spectrumanalyzer] Re: 1.0453 GHz Coax filter results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 16:15:18 UTC
From: w4zcb
Topic: 8897 Message: 8906

Me too! Although as an old friend always stipulated, "One experiment is worth a thousand expert opinions."

InLineBeginner, could you tell us how your measurements were made and what accuracies you feel you're achieving?

W4ZCB

>I would have assumed that the thread would introduce considerable
> surface field non-linearity and as such reduce the filter Q.
>
> Jurgen
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>
> On 12/13/2011 10:20 AM, inlinebeginner wrote:
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>> Yes. The entire stub was threded. Works very well. You might
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>> that day I asked you about if we can change this cavity filter to a
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>> > > > --- On Mon, 12/12/11, Len <redmond2@> wrote:
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8907. Re: [spectrumanalyzer] Re: 1.0453 GHz Coax filter results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 16:44:33 UTC
From: william sprowls
Topic: 8897 Message: 8907

Harold only threaded a small portion of the inner stub. One of the comments I made to him was, "Threading actually increases the surface length of the stub. Will this affect the electrical length?" I believe we agreed that if this were a much higher frequency filter, the skin effect would be significant and the extra surface length would alter the design. But, at 1 GHz, skin effect is not significant.
  Because this type of Coaxial Cavity Filter is not in wide usage in the electronics world, we MSA builders are learning something new every day.
 Definitely, fun stuff.
Scotty

--- On Tue, 12/13/11, w4zcb <w4zcb@...> wrote:

From: w4zcb <w4zcb@att.net>
Subject: Re: [spectrumanalyzer] Re: 1.0453 GHz Coax filter results
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, December 13, 2011, 10:15 AM

Me too! Although as an old friend always stipulated, "One experiment

is worth a thousand expert opinions."

InLineBeginner, could you tell us how your measurements were made and

what accuracies you feel you're achieving?

W4ZCB

>I would have assumed that the thread would introduce considerable

> surface field non-linearity and as such reduce the filter Q.

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> Jurgen

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> On 12/13/2011 10:20 AM, inlinebeginner wrote:

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>> Sam

>> Yes. The entire stub was threded. Works very well. You might

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>> that day I asked you about if we can change this cavity filter to a

>> band stop filter. After that, I spent some time to think about this

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>> Based on what I figured out, there are some other change we can do,

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>> --- In spectrumanalyzer@yahoogroups.com

>> <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@...>

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>> So for best performance, the stubs need to be just a tiny bit

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>> > > > Â Harold built his without any tuning screws. He threaded the

>> stubs and tuned by changing the internal length of the stubs.

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>> > > > --- On Mon, 12/12/11, Len <redmond2@> wrote:

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>> > > > From: Len <redmond2@>

>> > > > Subject: [spectrumanalyzer] 1.0453 GHz Coax filter results

>> > > > To: spectrumanalyzer@yahoogroups.com

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8908. Re: 1.0453 GHz Coax filter results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 16:55:09 UTC
From: inlinebeginner
Topic: 8897 Message: 8908

Jurgen and W4ZCB
You might be right. I only did some prelimiary tests and did not get that detailed data. In my test, I just use thread steel stub. I even use steel metal as end plate for experiment. I did get higher insertion loss for 1-pipe cavity, about 4.x dB. As my application does not care the insertion loss, I did not try brass. If we change to brass, I would expect 2 dB or 1.8dB.
I measured with HP8753ES (VNA). I will upload some results later.

Lin

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
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> From: w4zcb <w4zcb@...>
> Subject: Re: [spectrumanalyzer] Re: 1.0453 GHz Coax filter results
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, December 13, 2011, 10:15 AM
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8909. Re: 1.0453 GHz Coax filter results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 17:02:26 UTC
From: Sam
Topic: 8897 Message: 8909

Lin,
In theory, steel should be terrible, because skin depth is reduced by permeability, so the effective resistance will increase greatly, which is especially important for the stub. Though I believe there are "non-magnetic" steels.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
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> Jurgen and W4ZCB
> You might be right. I only did some prelimiary tests and did not get that detailed data. In my test, I just use thread steel stub. I even use steel metal as end plate for experiment. I did get higher insertion loss for 1-pipe cavity, about 4.x dB. As my application does not care the insertion loss, I did not try brass. If we change to brass, I would expect 2 dB or 1.8dB.
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> > >> 2.1GHz, from what I tested with a 1-pipe cavity filter.
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> > >> Based on what I figured out, there are some other change we can do,
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> > >> such as we can make this filter length shorter (cut to half), or we
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> > >> can also tune to 500MHz with the original Length....
> >
> > >> Lin
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> > >> --- In spectrumanalyzer@yahoogroups.com
> >
> > >> <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@>
> >
> > >> wrote:
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> > >> >
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> > >> > Lin,
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> > >> > So your entire stub was threaded? Interesting.
> >
> > >> > Sam W.
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> > >> >
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> > >> > --- In spectrumanalyzer@yahoogroups.com
> >
> > >> <mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner"
> >
> > >> <inlinebeginner@> wrote:
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> > >> > > Scotty
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> > >> > > I tried without top tuning screw and just used a long screw as
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> > >> stub tune from bottom, it works well. In theory, this would get
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> > >> highest Q, and best rejection at 1034MHz. Also, the cavity filter
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> > >> will
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> > >> become a tuneable filter, can work from 970MHz to 2.1GHz.
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> > >> > > Lin
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> > >> > > --- In spectrumanalyzer@yahoogroups.com
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> > >> <mailto:spectrumanalyzer%40yahoogroups.com>, william sprowls
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> > >> <wsprowls@> wrote:
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> > >> > > > Hi Len and All,
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> > >> > > > Ã☐ "Whether having Ã☐ less tuning screw stub poking inside the
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> > >> cavity is a good thing or not?"
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> > >> > > > Ã☐ A Coaxial Cavity Filter without a tuning screw will exhibit
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> > >> slightly less insertion loss and narrower bandwidth (higher Q). It
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> > >> will also be less susceptible to temperature changes (tuning
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> > >> drift).
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> > >> So for best performance, the stubs need to be just a tiny bit
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> > >> shorter
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> > >> than the electrical length so that only a very small amount of

> >
> > >> tuning
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> > >> screw (end capacitance) is needed to tune it true.
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> > >> > > > Ã☐ Harold built his without any tuning screws. He threaded the
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> > >> stubs and tuned by changing the internal length of the stubs.
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> > >> > > > --- On Mon, 12/12/11, Len <redmond2@> wrote:
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> > >> > > > From: Len <redmond2@>
> >
> > >> > > > Subject: [spectrumanalyzer] 1.0453 GHz Coax filter results
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> > >> > > > To: spectrumanalyzer@yahoogroups.com
> >
> > >> <mailto:spectrumanalyzer%40yahoogroups.com>
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> > >> > > > Date: Monday, December 12, 2011, 8:41 PM
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> > >> > > > Hello Group Ã☐ All the 1.0453 GHz parts lengths were shortened
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> > >> 3% Ã☐ (up 32 MHz) from the normal 1.013 GHz standard sizes.This is
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> > >> based on my assumption of linear scaling. Ã☐ I can tune the 4 tube
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> > >> 1.0453 GHz Coax cavity filter up to 1.054 GHz and down to 0.990 GHz
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> > >> the
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> > >> inner post length is still a bit too long. Ã☐ I am not sure if the
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> > >> tuning Center Point is supposed to be at 1.0453 GHz or not.Whether
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> > >> having Ã☐ less tuning screw stub poking inside the cavity is a good
> >
> > >> thing or not? Ã☐ If there is a next time I will shorten them another

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> > >> 2%. The old suck it and see method.RegardsLen Spyker Ã☐ Ã☐
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8910. Re: 1.0453 GHz Coax filter results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 17:09:37 UTC
From: inlinebeginner
Topic: 8897 Message: 8910

Sam and all
I put a photo here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/138374542/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
At 974MHz I got 4.2dB insertion loss, at 1.5GHz, I got 5.67dB insertion loss with steel stub and steel bottom metal.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Lin,
> In theory, steel should be terrible, because skin depth is reduced by permeability, so the effective resistance will increase greatly, which is especially important for the stub. Though I believe there are "non-magnetic" steels.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Jurgen and W4ZCB
> > You might be right. I only did some prelimiary tests and did not get that detailed data. In my test, I just use thread steel stub. I even use steel metal as end plate for experiment. I did get higher insertion loss for 1-pipe cavity, about 4.x dB. As my application does not care the insertion loss, I did not try brass. If we change to brass, I would expect 2 dB or 1.8dB.
> > I measured with HP8753ES (VNA). I will upload some results later.
> >
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > >
> > > Â Harold only threaded a small portion of the inner stub. One of the comments I made to him was, "Threading actually increases the surface length of the stub. Will this affect the electrical length?" I believe we agreed that if this were a much higher frequency filter, the skin effect would be significant and the extra surface length would alter the design. But, at 1 GHz, skin effect is not significant.
> > > Â Because this type of Coaxial Cavity Filter is not in wide usage in the electronics world, we MSA builders are learning something new every day.
> > > Â Definitely, fun stuff.
> > > Scotty
> > >
> > > --- On Tue, 12/13/11, w4zcb <w4zcb@> wrote:
> > >
> > > From: w4zcb <w4zcb@>
> > > Subject: Re: [spectrumanalyzer] Re: 1.0453 GHz Coax filter results
> > > To: spectrumanalyzer@yahoogroups.com
> > > Date: Tuesday, December 13, 2011, 10:15 AM
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> > > Me too! Although as an old friend always stipulated, "One experiment
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> > > is worth a thousand expert opinions."
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> > >
> > > InLineBeginner, could you tell us how your measurements were made and
> > >
> > > what accuracies you feel you're achieving?
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> > >
> > > W4ZCB
> > >
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> > > >I would have assumed that the thread would introduce considerable
> > >
> > > > surface field non-linearity and as such reduce the filter Q.
> > >
> > > >
> > >
> > > > Jurgen
> > >

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> > >
> > > > On 12/13/2011 10:20 AM, inlinebeginner wrote:
> > >
> > > >>
> > >
> > > >> Sam
> > >
> > > >> Yes. The entire stub was threded. Works very well. You might
> > >
> > > >> remember
> > >
> > > >> that day I asked you about if we can change this cavity filter to a
> > >
> > > >> band stop filter. After that, I spent some time to think about this
> > >
> > > >> filter, and eventually, I figured out how it works. Base on how it
> > >
> > > >> works, I found if we change the stub to threaded, it will be a
> > >
> > > >> tuneable filter. The insertion loss will not change from 970MHz to
> > >
> > > >> 2.1GHz, from what I tested with a 1-pipe cavity filter.
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> > > >> Based on what I figured out, there are some other change we can do,
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> > > >> such as we can make this filter length shorter (cut to half), or we
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> > > >> Lin
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> > > >> --- In spectrumanalyzer@yahoogroups.com
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> > > >> <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@>
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> > > >> wrote:
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> > > >> > Lin,
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> > > >> > So your entire stub was threaded? Interesting.
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> > > >> > Sam W.

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> > > >> > --- In spectrumanalyzer@yahoogroups.com
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> > > >> <mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner"
> > >
> > > >> <inlinebeginner@> wrote:
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> > > >> > > Scotty
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> > > >> > > I tried without top tuning screw and just used a long screw as
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> > > >> stub tune from bottom, it works well. In theory, this would get
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> > > >> highest Q, and best rejection at 1034MHz. Also, the cavity filter
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> > > >> > > --- In spectrumanalyzer@yahoogroups.com
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> > > >> <mailto:spectrumanalyzer%40yahoogroups.com>, william sprowls
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> > > >> <wsprowls@> wrote:
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> > > >> > > > Hi Len and All,
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> > > >> > > > Ã☐ "Whether having Ã☐ less tuning screw stub poking inside the
> > >
> > > >> cavity is a good thing or not?"
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> > > >> > > > Ã☐ A Coaxial Cavity Filter without a tuning screw will exhibit
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> > > >> slightly less insertion loss and narrower bandwidth (higher Q). It
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> > > >> will also be less susceptible to temperature changes (tuning
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> > > >> drift).
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> > > >> So for best performance, the stubs need to be just a tiny bit
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> > > >> tuning
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> > > >> screw (end capacitance) is needed to tune it true.
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> > > >> > > > Ã☐ Harold built his without any tuning screws. He threaded the
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> > > >> > > > --- On Mon, 12/12/11, Len <redmond2@> wrote:
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> > > >> > > > From: Len <redmond2@>
> > >
> > > >> > > > Subject: [spectrumanalyzer] 1.0453 GHz Coax filter results
> > >
> > > >> > > > To: spectrumanalyzer@yahoogroups.com
> > >
> > > >> <mailto:spectrumanalyzer%40yahoogroups.com>
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> > > >> > > > Date: Monday, December 12, 2011, 8:41 PM
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> > > >> 3% Ã☐ (up 32 MHz) from the normal 1.013 GHz standard sizes.This is
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> > > >> based on my assumption of linear scaling. Ã☐ I can tune the 4 tube
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> > > >> 1.0453 GHz Coax cavity filter up to 1.054 GHz and down to 0.990 GHz
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> > > >> while still working properlyUp 9 MHz and down 55 MHz seems to me
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> > > >> inner post length is still a bit too long. Ã☐ I am not sure if the
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> > > >> tuning Center Point is supposed to be at 1.0453 GHz or not.Whether
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> > > >> 2%. The old suck it and see method.RegardsLen Spyker Ã☐ Ã☐
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8911. Re: 1.0453 GHz Coax filter results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 17:39:09 UTC
From: undercoupled
Topic: 8897 Message: 8911

Threaded connections, especially with high resistance materials, might lead to intermod distortion. When I was a child (a long time ago), I used rusty steel as a detector for a home made diode receiver. This effect might not be a problem at the low impedance end of the stub.
Jerry

8912. Mixer 1 maximum input power

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 17:41:03 UTC
From: inlinebeginner
Topic: 8912 Message: 8912

Scotty
ADE-11X spec does not say how much power we can apply to R and I port. You swapped the I and R as Mixer 1, in this case, if we apply 0dBm at MSA input, does this mixer work properly? The Spec does say P1dB = +1dBm.
Thanks
Lin

8913. Noise Experiment

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 19:05:43 UTC
From: Sam
Topic: 8913 Message: 8913

As Harold said, one experiment is worth a thousand expert opinions, so I did an experiment with an amplifier in front of my cavity filter. Just an amp, no SAW or other additional filter.

I used a 30 dB amp with 20 dB pad on the output, for a net of 10 dB gain. The amp spec says it has NF=2.3 dB. I inserted it between my diplexer output and the cavity input. I did not recalibrate, so the display levels became meaningless, so I just looked for the "minimum visible signal", which by my definition is the minimum signal that is recognizable as a distinct signal on every scan, even though its shape keeps changing due to noise. That signal previously was about -110 dBm, so I tried a level of -120 dBm. Lo and behold, there was the signal, visible on every scan, though sometimes choppy. (Note: the minimum visible signal seems to come out about 5-8 dB above the level that shows a consistent response during calibration. You can also "cheat" by zooming in to make the signal wide, which makes it more visible. When comparing with and without amp, you just have to apply the same standards both times.)

As to the high end: (I use the expanded log detector and an IF2 amp with gain of 28 dB, so others might get different results.) Up to about -10 dBm the response was very linear and then started to taper off. The change in response was still good at -5 dBm, and easily detectable but weak at 0 dBm.

Next step is to reduce the IF2 amp gain by a couple dB to make the response at 0 dBm a bit more solid. We'll see if that increases the minimum visible signal.

One downside of the amp is the possibility of IMD. But I suspect Mixer 1 is more of an IMD problem than the amp is. Still, to reduce the IMD possibilities (and maybe some spurs) I think I would at least put a low pass filter on the amp input to reduce signals at >1.5 GHz, because the LO1 harmonics are so strong. Of course, you could use a SAW as the filter, with better filtering but more loss.

In short, this works quite well.

P.S. the above was done with RBW=600 Hz. I increased the amp to 15 dB and wasn't sure whether or not there was an improvement. Reduced it to 6 dB and things got slightly worse. I then tried it with RBW=8 kHz with the 10 dB amp and got slightly better results than at 600 Hz. How well the amp works depends in part on where the noise bottleneck is in your MSA. A certain amount of narrow band noise reaches the log detector and the log detector adds a lot of wide band noise. Once you reduce the narrow band noise enough so the wide band noise dominates, further reductions accomplish nothing.

Sam W.

8914. Re: Mixer 1 maximum input power

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 21:34:17 UTC
From: Sam
Topic: 8912 Message: 8914

Lin,
I tried up to 7 dBm at the MSA input. I think my Mixer 1 has a 2.5 or 3 dB pad at its input, so this was 4-4.5 dBm at the actual mixer. I got a response of about 0.5 dBm change in output for 1 dB change in input. I'm sure the distortion was horrendous.

My objective is to get some functionality with 0 dB at the MSA input, but I don't expect a lot of precision above -5 dBm. And if you're in SA mode and worried about harmonics, -20 dBm is more reasonable.

One issue I did not test is that the mixer response probably varies over frequency at high input levels in a different way than it does at low input levels. For example, P1dB probably changes with frequency. That is one reason I wouldn't expect great precision above -5 dBm.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Scotty
> ADE-11X spec does not say how much power we can apply to R and I port. You swapped the I and R as Mixer 1, in this case, if we apply 0dBm at MSA input, does this mixer work properly? The Spec does say P1dB = +1dBm.
> Thanks
> Lin
>

8915. Re: [spectrumanalyzer] Mixer 1 maximum input power

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 21:40:18 UTC
From: william sprowls
Topic: 8912 Message: 8915

Hi Lin,
It did at one time. They have been changing their data sheets over the last few years. It is 50 mw, any port (+17 dBm), max power without damage.
Scotty

--- On Tue, 12/13/11, inlinebeginner <inlinebeginner@...> wrote:

From: inlinebeginner <inlinebeginner@...>
Subject: [spectrumanalyzer] Mixer 1 maximum input power
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, December 13, 2011, 11:41 AM

Scotty

ADE-11X spec does not say how much power we can apply to R and I port. You swapped the I and R as Mixer 1, in this case, if we apply 0dBm at MSA input, does this mixer work properly? The Spec does say P1dB = +1dBm.

Thanks

Lin

8916. Re: [spectrumanalyzer] Noise Experiment

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 21:49:54 UTC
From: william sprowls
Topic: 8913 Message: 8916

With an amplifier on the output of Mixer 1, consider this. Because of "fair" mixer isolation the L port power will be about 35 dB down at the R port. +7-35=-28 dBm. With a 30 dB amplifier, this is a honking +2 dBm out of the amplifier. Not knowing your flavor of amplifier, is it in saturation?
Scotty

--- On Tue, 12/13/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Noise Experiment
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, December 13, 2011, 1:05 PM

As Harold said, one experiment is worth a thousand expert opinions, so I did an experiment with an amplifier in front of my cavity filter. Just an amp, no SAW or other additional filter.

I used a 30 dB amp with 20 dB pad on the output, for a net of 10 dB gain. The amp spec says it has NF=2.3 dB. I inserted it between my diplexer output and the cavity input. I did not recalibrate, so the display levels became meaningless, so I just looked for the "minimum visible signal", which by my definition is the minimum signal that is recognizable as a distinct signal on every scan, even though its shape keeps changing due to noise. That signal previously was about -110 dBm, so I tried a level of -120 dBm. Lo and behold, there was the signal, visible on every scan, though sometimes choppy. (Note: the minimum visible signal seems to come out about 5-8 dB above the level that shows a consistent response during calibration. You can also "cheat" by zooming in to make the signal wide, which makes it more visible. When comparing with and without amp, you just have to apply the same standards both times.)

As to the high end: (I use the expanded log detector and an IF2 amp with gain of 28 dB, so others might get different results.) Up to about -10 dBm the response was very linear and then started to taper off. The change in response was still good at -5 dBm, and easily detectable but weak at 0 dBm.

Next step is to reduce the IF2 amp gain by a couple dB to make the response at 0 dBm a bit more solid. We'll see if that increases the minimum visible signal.

One downside of the amp is the possibility of IMD. But I suspect Mixer 1 is more of an IMD problem than the amp is. Still, to reduce the IMD possibilities (and maybe some spurs) I think I would at least put a low pass filter on the amp input to reduce signals at >1.5 GHz, because the LO1 harmonics are so strong. Of course, you could use a SAW as the filter, with better filtering but more loss.

In short, this works quite well.

P.S. the above was done with RBW=600 Hz. I increased the amp to 15 dB and wasn't sure whether or not there was an improvement. Reduced it to 6 dB and things got slightly worse.

I then tried it with RBW=8 kHz with the 10 dB amp and got slightly better results than at 600 Hz. How well the amp works depends in part on where the noise bottleneck is in your MSA. A certain amount of narrow band noise reaches the log detector and the log detector adds a lot of wide band noise. Once you reduce the narrow band noise enough so the wide band noise dominates, further reductions accomplish nothing.

Sam W.

8917. Re: Mixer 1 maximum input power

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 22:08:23 UTC
From: inlinebeginner
Topic: 8912 Message: 8917

Sam
Thanks for the infor. If we put 3dB pad at MSA input, at 0dBm input, the mixer 1 will see -3dBm. We map this signal to +15dBm at log detector. The overall MSA gain = 15dB.
As log detector responses very well at -90dBm, that means we can measure a signal well at -105dBm if the noise floor can be at -115dBm with a RBW filter. Suppose we use 1kHz RBW filter, the overall required MSA NF should be 14dB, which is a little bit hard to implement. With a calculation, we get NF=18dB. That means the noise floor is 4 dB higher than what we expected, which is -111dBm.
Therefore the dynamic range is -111dBm. We can clearly see a -105dBm signal, for a -110dBm signal, we can see it, but the SNR is almost 0.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Lin,
> I tried up to 7 dBm at the MSA input. I think my Mixer 1 has a 2.5 or 3 dB pad at its input, so this was 4-4.5 dBm at the actual mixer. I got a response of about 0.5 dBm change in output for 1 dB change in input. I'm sure the distortion was horrendous.
>
> My objective is to get some functionality with 0 dB at the MSA input, but I don't expect a lot of precision above -5 dBm. And if you're in SA mode and worried about harmonics, -20 dBm is more reasonable.
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> One issue I did not test is that the mixer response probably varies over frequency at high input levels in a different way than it does at low input levels. For example, P1dB probably changes with frequency. That is one reason I wouldn't expect great precision above -5 dBm.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Scotty
> > ADE-11X spec does not say how much power we can apply to R and I port. You swapped the I and R as Mixer 1, in this case, if we apply 0dBm at MSA input, does this mixer work properly? The Spec does say P1dB = +1dBm.
> > Thanks
> > Lin
> >
>

8918. Re: 1.0453 GHz Coax filter results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 22:14:16 UTC
From: inlinebeginner
Topic: 8897 Message: 8918

I just changed my steel stub and steel bottom metal sheet to brass stub and plate, the insertion loss change from 5.x dB to 2.2dB. Over 970MHz to 2GHz. 3dB BW is around 6 MHz.
Lin

--- In spectrumanalyzer@yahoogroups.com, "undercoupled" <undercoupled@...> wrote:
>
> Threaded connections, especially with high resistance materials, might lead to intermod distortion. When I was a child (a long time ago), I used rusty steel as a detector for a home made diode receiver. This effect might not be a problem at the low impedance end of the stub.
> Jerry
>

8919. Tool To Use to Model Cavity MSA and SAW MSA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 22:21:41 UTC
From: nealmartini
Topic: 8919 Message: 8919

All,

There have been several discussions going on re: using the SAW-1013 filter in combination with different PADding, in addition to the cavity filter,etc. So I didn't have to keep pulling out my calculator to crank through the different scenarios, I decided to input the signal chains for the cavitiy MSA and the SAW MSA into an evaluation model. I used the the free tool from Analog Devices called ADIsimRF.

For those of you not familiar with this tool, you should take a look at it. It is as excellent way to look at the effects on noise and signal levels along a signal chain in a very structured way.

I added a file to the group file on the "1013 MHz Filter" file called MSA_ADIsimRF.docx that shows the assumptions I used and the results of a few scenarios.

http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/

The outputs I included show what happens to the signal chains as you vary the input from minimum (log detector driven) to maximum (final filter input level driven). I think I represented things accurately.

If you look at this data closely you will see that the main effect of using the SAW filter instead of the cavity filter is that the dynamic range shifts down by about 8 dB. The SAW lowers the maximum input by this same amount, but that can be handled with the use of an attenuator at the input to the MSA.

The tool is also an easy way to evaluate several of the good proposals being currently discussed by the group. The signal chain is easily modified. I hope this is of interest to some of you.

By the way, a post describing the next steps in the group buy process will be sent out tonight.

8920. Re: Tool To Use to Model Cavity MSA and SAW MSA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 22:42:43 UTC
From: inlinebeginner
Topic: 8919 Message: 8920

Mixer 1 noise figure may not be 7.1dB. If we do not put any noise filter at mixer 1 input, the noise at mixer 1 output will be doulbed, therefore, it is 10.1dB. But the gain is -7.1dB.
As we always add 3dB pad at MSA input, you may want to use gain=-10.1dB and NF=-13.1dB
Lin

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> All,
>
> There have been several discussions going on re: using the SAW-1013 filter in combination with different PADding, in addition to the cavity filter,etc. So I didn't have to keep pulling out my calculator to crank through the different scenarios, I decided to input the signal chains for the cavitiy MSA and the SAW MSA into an evaluation model. I used the the free tool from Analog Devices called ADIsimRF.
>
> For those of you not familiar with this tool, you should take a look at it. It is as excellent way to look at the effects on noise and signal levels along a signal chain in a very structured way.
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> I added a file to the group file on the "1013 MHz Filter" file called MSA_ADIsimRF.docx that shows the assumptions I used and the results of a few scenarios.
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> http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/
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> The outputs I included show what happens to the signal chains as you vary the input from minimum (log detector driven) to maximum (final filter input level driven). I think I represented things accurately.
>
> If you look at this data closely you will see that the main effect of using the SAW filter instead of the cavity filter is that the dynamic range shifts down by about 8 dB. The SAW lowers the maximum input by this same amount, but that can be handled with the use of an attenuator at the input to the MSA.
>
> The tool is also an easy way to evaluate several of the good proposals being currently discussed by the group. The signal chain is easily modified. I hope this is of interest to some of you.
>
> By the way, a post describing the next steps in the group buy process will be sent out tonight.
>

8921. Re: [spectrumanalyzer] Re: 1.0453 GHz Coax filter results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 22:43:16 UTC
From: w4zcb
Topic: 8897 Message: 8921

Is this a single cavity or multiple?

W4ZCB

I just changed my steel stub and steel bottom metal sheet to brass
stub and plate, the insertion loss change from 5.x dB to 2.2dB. Over
970MHz to 2GHz. 3dB BW is around 6 MHz.
Lin

--- In spectrumanalyzer@yahoogroups.com, "undercoupled"
<undercoupled@...> wrote:
>
> Threaded connections, especially with high resistance materials,
> might lead to intermod distortion. When I was a child (a long time
> ago), I used rusty steel as a detector for a home made diode
> receiver. This effect might not be a problem at the low impedance
> end of the stub.
> Jerry
>

8922. Re: Tool To Use to Model Cavity MSA and SAW MSA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 22:57:10 UTC
From: nealmartini
Topic: 8919 Message: 8922

Lin,

Good suggestion. The nice thing about having the signal chain in model form is that your suggestion is easy to insert and try.

Thanks
Neal

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Mixer 1 noise figure may not be 7.1dB. If we do not put any noise filter at mixer 1 input, the noise at mixer 1 output will be doulbed, therefore, it is 10.1dB. But the gain is -7.1dB.
> As we always add 3dB pad at MSA input, you may want to use gain=-10.1dB and NF=-13.1dB
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@> wrote:
> >
> > All,
> >
> > There have been several discussions going on re: using the SAW-1013 filter in combination with different PADding, in addition to the cavity filter,etc. So I didn't have to keep pulling out my calculator to crank through the different scenarios, I decided to input the signal chains for the cavitiy MSA and the SAW MSA into an evaluation model. I used the the free tool from Analog Devices called ADIsimRF.
> >
> > For those of you not familiar with this tool, you should take a look at it. It is as excellent way to look at the effects on noise and signal levels along a signal chain in a very structured way.
> >
> > I added a file to the group file on the "1013 MHz Filter" file called MSA_ADIsimRF.docx that shows the assumptions I used and the results of a few scenarios.
> >
> > http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/
> >
> > The outputs I included show what happens to the signal chains as you vary the input from minimum (log detector driven) to maximum (final filter input level driven). I think I represented things accurately.
> >
> > If you look at this data closely you will see that the main effect of using the SAW filter instead of the cavity filter is that the dynamic range shifts down by about 8 dB. The SAW lowers the maximum input by this same amount, but that can be handled with the use of an attenuator at the input to the MSA.
> >
> > The tool is also an easy way to evaluate several of the good proposals being currently discussed by the group. The signal chain is easily modified. I hope this is of interest to

some of you.
> >
> > By the way, a post describing the next steps in the group buy process will be sent out tonight.
> >
>

8923. Re: 1013 MHz SAW Filter Alternative for the MSA Cavity Filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-13 23:35:22 UTC
From: ron
Topic: 8774 Message: 8923

add me to the list for 1 set.
ron, kc0tdj

8924. Re: Tool To Use to Model Cavity MSA and SAW MSA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 00:33:49 UTC
From: Sam
Topic: 8919 Message: 8924

That is definitely a nifty tool. I don't mean to sound like an anti-mathematician, but it seems like we are very close to being able to insert the SAW module into an MSA to see what it really does. (Though I understand that Neal is not presently in a position to do this. The real world intervenes.) I think we are at the point where we will not know anything further until the new module is actually tried.

Rex, I think you said you have built one and were about to install it. If so, let us know how it works out.

I'm also curious as to what happens to the SAW profile when it has non-50-ohm input and output, which will be the case with a mixer on each end. Not that its exact profile is all that critical, but it would be nice if no unfortunate bump develops.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> Lin,
>
> Good suggestion. The nice thing about having the signal chain in model form is that your suggestion is easy to insert and try.
>
> Thanks
> Neal
>
>
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Mixer 1 noise figure may not be 7.1dB. If we do not put any noise filter at mixer 1 input, the noise at mixer 1 output will be doulbed, therefore, it is 10.1dB. But the gain is -7.1dB.
> > As we always add 3dB pad at MSA input, you may want to use gain=-10.1dB and NF=-13.1dB
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@> wrote:
> > >
> > > All,
> > >
> > > There have been several discussions going on re: using the SAW-1013 filter in combination with different PADding, in addition to the cavity filter,etc. So I didn't have to keep pulling out my calculator to crank through the different scenarios, I decided to input the signal chains for the cavitiy MSA and the SAW MSA into an evaluation model. I used the the free tool from Analog Devices called ADIsimRF.
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> > > For those of you not familiar with this tool, you should take a look at it. It is as

excellent way to look at the effects on noise and signal levels along a signal chain in a very structured way.
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> > > I added a file to the group file on the "1013 MHz Filter" file called MSA_ADIsimRF.docx that shows the assumptions I used and the results of a few scenarios.
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> > > http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/
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> > > The outputs I included show what happens to the signal chains as you vary the input from minimum (log detector driven) to maximum (final filter input level driven). I think I represented things accurately.
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> > > If you look at this data closely you will see that the main effect of using the SAW filter instead of the cavity filter is that the dynamic range shifts down by about 8 dB. The SAW lowers the maximum input by this same amount, but that can be handled with the use of an attenuator at the input to the MSA.
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> > > The tool is also an easy way to evaluate several of the good proposals being currently discussed by the group. The signal chain is easily modified. I hope this is of interest to some of you.
> > >
> > > By the way, a post describing the next steps in the group buy process will be sent out tonight.
> > >
> >
>

8925. SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 00:38:40 UTC
From: nealmartini
Topic: 8925 Message: 8925

All,

As I am sure you have observed, the group interest SAW Based 1013 MHz filter is quite high. It is now time to take the next steps in our process to make this happen. Since the requested numbers are so high, please follow the steps below to help keep the process as simple as possible so it doesn't become a part time job for me.

Here's your to do list:

1.Don't send money yet! I still am waiting for SAW quote data and shipping cost refinements. The cost for 3 SAWs and 1 PCB shipped to you should be < $18 in for US and < $21 International.

2.Please send me a direct email (nealmartini@cableone.net) with the following information:

*Your DIRECT email address.

*The number of sets of parts you want (1 set = 3 SAWs + PCB). No separate quantities of SAWs and PCBs please.

*Your group ID (name you use for posting in this group).

*Your mailing address exactly as it should appear on a mailing package (i.e. multiple lines) so I can cut and paste it without having to split up lines.

*If you are outside the US, please indicate if you would be willing to be a shipping destination for participants in your region to help simplify customs and minimize shipping costs. You will be given the $ to pay for the shipping costs.

Please send the above email by December 22nd. At that point I will have firmed up costs and will send out instructions on where to PayPal money.

Thanks for your cooperation on this!

Neal

8926. Re: Tool To Use to Model Cavity MSA and SAW MSA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 00:56:34 UTC
From: inlinebeginner
Topic: 8919 Message: 8926

HP appCad (http://www.hp.woodshot.com/) is also a good tool, it is free. A lot of professional RF engineers are using it.
For Noise calculation, I normally create a spreadsheet. If you know the formula, create your own calculator is not that hard.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> That is definitely a nifty tool. I don't mean to sound like an anti-mathematician, but it seems like we are very close to being able to insert the SAW module into an MSA to see what it really does. (Though I understand that Neal is not presently in a position to do this. The real world intervenes.) I think we are at the point where we will not know anything further until the new module is actually tried.
>
> Rex, I think you said you have built one and were about to install it. If so, let us know how it works out.
>
> I'm also curious as to what happens to the SAW profile when it has non-50-ohm input and output, which will be the case with a mixer on each end. Not that its exact profile is all that critical, but it would be nice if no unfortunate bump develops.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@> wrote:
> >
> > Lin,
> >
> > Good suggestion. The nice thing about having the signal chain in model form is that your suggestion is easy to insert and try.
> >
> > Thanks
> > Neal
> >
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > >
> > > Mixer 1 noise figure may not be 7.1dB. If we do not put any noise filter at mixer 1 input, the noise at mixer 1 output will be doulbed, therefore, it is 10.1dB. But the gain is -7.1dB.
> > > As we always add 3dB pad at MSA input, you may want to use gain=-10.1dB and NF=-13.1dB
> > > Lin
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@> wrote:

> > > >
> > > > All,
> > > >
> > > > There have been several discussions going on re: using the SAW-1013 filter in combination with different PADding, in addition to the cavity filter,etc. So I didn't have to keep pulling out my calculator to crank through the different scenarios, I decided to input the signal chains for the cavitiy MSA and the SAW MSA into an evaluation model. I used the the free tool from Analog Devices called ADIsimRF.
> > > >
> > > > For those of you not familiar with this tool, you should take a look at it. It is as excellent way to look at the effects on noise and signal levels along a signal chain in a very structured way.
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> > > > I added a file to the group file on the "1013 MHz Filter" file called MSA_ADIsimRF.docx that shows the assumptions I used and the results of a few scenarios.
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> > > > http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/
> > > >
> > > > The outputs I included show what happens to the signal chains as you vary the input from minimum (log detector driven) to maximum (final filter input level driven). I think I represented things accurately.
> > > >
> > > > If you look at this data closely you will see that the main effect of using the SAW filter instead of the cavity filter is that the dynamic range shifts down by about 8 dB. The SAW lowers the maximum input by this same amount, but that can be handled with the use of an attenuator at the input to the MSA.
> > > >
> > > > The tool is also an easy way to evaluate several of the good proposals being currently discussed by the group. The signal chain is easily modified. I hope this is of interest to some of you.
> > > >
> > > > By the way, a post describing the next steps in the group buy process will be sent out tonight.
> > > >
> > >
> >
>

8927. Re: [spectrumanalyzer] Re: Tool To Use to Model Cavity MSA and SAW MSA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 01:13:18 UTC
From: william sprowls
Topic: 8919 Message: 8927

Sam and All,
Neal sent me the SAWs yesterday. Snail mail. Darn e-mail won't deliver hardware. I'm going to go through the whole build process and document it.
Scotty

--- On Tue, 12/13/11, Sam <swetterlin@...> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: Tool To Use to Model Cavity MSA and SAW MSA
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, December 13, 2011, 6:33 PM

That is definitely a nifty tool. I don't mean to sound like an anti-mathematician, but it seems like we are very close to being able to insert the SAW module into an MSA to see what it really does. (Though I understand that Neal is not presently in a position to do this. The real world intervenes.) I think we are at the point where we will not know anything further until the new module is actually tried.

Rex, I think you said you have built one and were about to install it. If so, let us know how it works out.

I'm also curious as to what happens to the SAW profile when it has non-50-ohm input and output, which will be the case with a mixer on each end. Not that its exact profile is all that critical, but it would be nice if no unfortunate bump develops.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:

>

> Lin,

>

> Good suggestion. The nice thing about having the signal chain in model form is that your suggestion is easy to insert and try.

>

> Thanks

> Neal

>

>

>

> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:

> >

> > Mixer 1 noise figure may not be 7.1dB. If we do not put any noise filter at mixer 1 input, the noise at mixer 1 output will be doulbed, therefore, it is 10.1dB. But the gain is -7.1dB.

> > As we always add 3dB pad at MSA input, you may want to use gain=-10.1dB and NF=-13.1dB

> > Lin

> >

> > --- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@> wrote:

> > >

> > > All,

> > >

> > > There have been several discussions going on re: using the SAW-1013 filter in combination with different PADding, in addition to the cavity filter,etc. So I didn't have to keep pulling out my calculator to crank through the different scenarios, I decided to input the signal chains for the cavitiy MSA and the SAW MSA into an evaluation model. I used the the free tool from Analog Devices called ADIsimRF.

> > >

> > > For those of you not familiar with this tool, you should take a look at it. It is as excellent way to look at the effects on noise and signal levels along a signal chain in a very structured way.

> > >

> > > I added a file to the group file on the "1013 MHz Filter" file called MSA_ADIsimRF.docx that shows the assumptions I used and the results of a few scenarios.

> > >

> > > http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/

> > >

> > > The outputs I included show what happens to the signal chains as you vary the input from minimum (log detector driven) to maximum (final filter input level driven). I think I represented things accurately.

> > >

> > > If you look at this data closely you will see that the main effect of using the SAW filter instead of the cavity filter is that the dynamic range shifts down by about 8 dB. The SAW lowers the maximum input by this same amount, but that can be handled with the use

of an attenuator at the input to the MSA.

> > >

> > > The tool is also an easy way to evaluate several of the good proposals being currently discussed by the group. The signal chain is easily modified. I hope this is of interest to some of you.

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> > > By the way, a post describing the next steps in the group buy process will be sent out tonight.

> > >

> >

>

8928. Re: Tool To Use to Model Cavity MSA and SAW MSA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 01:18:04 UTC
From: nealmartini
Topic: 8919 Message: 8928

Lin,

By the way, I always have a filter (Minicircuits SMA type) on my MSA input. It is either a LPF or HPF depending on which frequency band I am in. I also use a 10 dB PAD (MiniCircuits SMA type)I can remove for low level signals.

Neal

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> Lin,
>
> Good suggestion. The nice thing about having the signal chain in model form is that your suggestion is easy to insert and try.
>
> Thanks
> Neal
>
>
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Mixer 1 noise figure may not be 7.1dB. If we do not put any noise filter at mixer 1 input, the noise at mixer 1 output will be doulbed, therefore, it is 10.1dB. But the gain is -7.1dB.
> > As we always add 3dB pad at MSA input, you may want to use gain=-10.1dB and NF=-13.1dB
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@> wrote:
> > >
> > > All,
> > >
> > > There have been several discussions going on re: using the SAW-1013 filter in combination with different PADding, in addition to the cavity filter,etc. So I didn't have to keep pulling out my calculator to crank through the different scenarios, I decided to input the signal chains for the cavitiy MSA and the SAW MSA into an evaluation model. I used the the free tool from Analog Devices called ADIsimRF.
> > >
> > > For those of you not familiar with this tool, you should take a look at it. It is as excellent way to look at the effects on noise and signal levels along a signal chain in a very structured way.
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> > > I added a file to the group file on the "1013 MHz Filter" file called MSA_ADIsimRF.docx that shows the assumptions I used and the results of a few scenarios.
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> > > http://groups.yahoo.com/group/spectrumanalyzer/files/1013%20MHz%20SAW%20Filter%20/

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> > > The outputs I included show what happens to the signal chains as you vary the input from minimum (log detector driven) to maximum (final filter input level driven). I think I represented things accurately.
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> > > If you look at this data closely you will see that the main effect of using the SAW filter instead of the cavity filter is that the dynamic range shifts down by about 8 dB. The SAW lowers the maximum input by this same amount, but that can be handled with the use of an attenuator at the input to the MSA.
> > >
> > > The tool is also an easy way to evaluate several of the good proposals being currently discussed by the group. The signal chain is easily modified. I hope this is of interest to some of you.
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> > > By the way, a post describing the next steps in the group buy process will be sent out tonight.
> > >
> >
>

8929. OT - Re: [spectrumanalyzer] Re: Tool To Use to Model Cavity MSA and SAW MSA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 01:30:34 UTC
From: Dan Andersson
Topic: 8919 Message: 8929

On Tue, 13 Dec 2011 17:13:18 -0800 (PST)
william sprowls <wsprowls@...> wrote:

> Sam and All,
> Neal sent me the SAWs yesterday. Snail mail. Darn e-mail won't deliver hardware. I'm going to go through the whole build process and document it.
> Scotty

Hmm,

The "real" Scotty would have it beamed up...

Instant web orders... Not in my lifetime probably...

//Dan, M0DFI

8930. Re: 1.0453 GHz Coax filter results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 01:40:50 UTC
From: inlinebeginner
Topic: 8897 Message: 8930

W4ZCB
Yes, it is a single cavity, juse hold the end plate with something. If I solder the end plate on, the insertion loss could be 1.8dB.
Lin

--- In spectrumanalyzer@yahoogroups.com, "w4zcb" <w4zcb@...> wrote:
>
> Is this a single cavity or multiple?
>
> W4ZCB
>
>
> I just changed my steel stub and steel bottom metal sheet to brass
> stub and plate, the insertion loss change from 5.x dB to 2.2dB. Over
> 970MHz to 2GHz. 3dB BW is around 6 MHz.
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "undercoupled"
> <undercoupled@> wrote:
> >
> > Threaded connections, especially with high resistance materials,
> > might lead to intermod distortion. When I was a child (a long time
> > ago), I used rusty steel as a detector for a home made diode
> > receiver. This effect might not be a problem at the low impedance
> > end of the stub.
> > Jerry
> >
>

8931. Re: Mixer 1 maximum input power

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 02:40:21 UTC
From: inlinebeginner
Topic: 8912 Message: 8931

Scotty
Thanks for the infor. For this mixer, at which power level it stops working? If I try to input a -125dBm at its input, does it still response? The output would be -132dBm, which is very low.
Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Lin,
> It did at one time. They have been changing their data sheets over the last few years. It is 50 mw, any port (+17 dBm), max power without damage.
> Scotty
>
> --- On Tue, 12/13/11, inlinebeginner <inlinebeginner@...> wrote:
>
> From: inlinebeginner <inlinebeginner@...>
> Subject: [spectrumanalyzer] Mixer 1 maximum input power
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, December 13, 2011, 11:41 AM
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>
> Scotty
>
> ADE-11X spec does not say how much power we can apply to R and I port. You swapped the I and R as Mixer 1, in this case, if we apply 0dBm at MSA input, does this mixer work properly? The Spec does say P1dB = +1dBm.
>
> Thanks
>
> Lin
>

8932. Re: [spectrumanalyzer] Re: Mixer 1 maximum input power

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 04:38:58 UTC
From: william sprowls
Topic: 8912 Message: 8932

Hi Lin,
I've never been asked that question, and it is a good one.
All mixers will operate down to theoretical noise floor. If the conversions loss of a mixer is -6.5 dB, then the smallest signal that can be converted is -174 + 6.5 = -167.5 dBm.
 Perhaps someone out there is using liquid helium and getting better results, but that's the best we can do at room temperature.
Scotty

--- On Tue, 12/13/11, inlinebeginner <inlinebeginner@yahoo.com> wrote:

From: inlinebeginner <inlinebeginner@...>
Subject: [spectrumanalyzer] Re: Mixer 1 maximum input power
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, December 13, 2011, 8:40 PM

Scotty

Thanks for the infor. For this mixer, at which power level it stops working? If I try to input a -125dBm at its input, does it still response? The output would be -132dBm, which is very low.

Thanks

Lin

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:

>

> Hi Lin,

> It did at one time. They have been changing their data sheets over the last few years. It is 50 mw, any port (+17 dBm), max power without damage.

> Scotty

>

> --- On Tue, 12/13/11, inlinebeginner <inlinebeginner@...> wrote:

>

> From: inlinebeginner <inlinebeginner@...>

> Subject: [spectrumanalyzer] Mixer 1 maximum input power

> To: spectrumanalyzer@yahoogroups.com

> Date: Tuesday, December 13, 2011, 11:41 AM

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> Scotty

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> ADE-11X spec does not say how much power we can apply to R and I port. You swapped the I and R as Mixer 1, in this case, if we apply 0dBm at MSA input, does this mixer work

properly? The Spec does say P1dB = +1dBm.

>

> Thanks

>

> Lin

>

8933. RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 07:52:23 UTC
From: Marc OLANIE
Topic: 8933 Message: 8933
Attachments: 1 described; binary payloads are missing from this source WARC

Hi Neal

Wouldn't it be possible to add the mmic in the SAW devices list ? Finding an ERA33 is quite impossible in Europe if you don't pass your order to Mini-Circuits UK, and I doubt they will accept selling such a device on a "per unit" basis. (without mentioning the fact that the S&H cost will be 20 Euros.. almost the cost of the Saw filter and many times the cost of the mmic itself)

And again, thank you for your time and energy.

Marc

A good working kernel is not supposed to crash unless it says "please"
(traduction : Da Power, Fantudjûû ! RuleZ Tartiflette !)

De: spectrumanalyzer@yahoogroups.com de la part de nealmartini
Date: mer. 14/12/2011 01:38
À: spectrumanalyzer@yahoogroups.com
Objet : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

All,

As I am sure you have observed, the group interest SAW Based 1013 MHz filter is quite high. It is now time to take the next steps in our process to make this happen. Since the requested numbers are so high, please follow the steps below to help keep the process as simple as possible so it doesn't become a part time job for me.

Here's your to do list:

1.Don't send money yet! I still am waiting for SAW quote data and shipping cost refinements. The cost for 3 SAWs and 1 PCB shipped to you should be < $18 in for US and < $21 International.

2.Please send me a direct email (nealmartini@cableone.net) with the following information:

*Your DIRECT email address.

*The number of sets of parts you want (1 set = 3 SAWs + PCB). No separate quantities of SAWs and PCBs please.

*Your group ID (name you use for posting in this group).

*Your mailing address exactly as it should appear on a mailing package (i.e. multiple lines) so I can cut and paste it without having to split up lines.

*If you are outside the US, please indicate if you would be willing to be a shipping destination for participants in your region to help simplify customs and minimize shipping costs. You will be given the $ to pay for the shipping costs.

Please send the above email by December 22nd. At that point I will have firmed up costs and will send out instructions on where to PayPal money.

Thanks for your cooperation on this!

Neal

Yahoo! Groups Links

8934. RE: [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 10:15:56 UTC
From: michel pacquelin
Topic: 8933 Message: 8934
Attachments: 1 described; binary payloads are missing from this source WARC

Hi Neal

je ne parle pas anglais mais le comprend.

1 ensemble pour moi aussi (2 saw +pcb + era33 si possible)

reglement paypal

1 set for me too (2 + pcb + era33 saw if possible)

Rules paypal

merci cordialement

michel f1chm

De: <mailto:spectrumanalyzer@yahoogroups.com>
spectrumanalyzer@yahoogroups.com de la part de nealmartini

Date: mer. 14/12/2011 01:38

À: <mailto:spectrumanalyzer@yahoogroups.com>
spectrumanalyzer@yahoogroups.com

Objet : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

All,

As I am sure you have observed, the group interest SAW Based 1013 MHz filter is quite high. It is now time to take the next steps in our process to make this happen. Since the requested numbers are so high, please follow the steps below to help keep the process as simple as possible so it doesn't become a part time job for me.

Here's your to do list:

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nealmartini@...) with the following information:

*Your DIRECT email address.

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Please send the above email by December 22nd. At that point I will have firmed up costs and will send out instructions on where to PayPal money.

Thanks for your cooperation on this!

Neal

Yahoo! Groups Links

8935. Re: Mixer 1 maximum input power

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 14:27:57 UTC
From: Sam
Topic: 8912 Message: 8935

Lin,
Consider this: Mixer 2 presently operates with roughly 15 dB less input than Mixer 1. The MSA is operating fine with inputs of -110 dBm, which means Mixer 2 is operating fine with input of -125 dBm. Which means Mixer 1 would also operate at -125 dBm. In reality, the lower limit of usefulness is not whether the mixers produce a response, but the amount of noise that gets added later. Just a 1 kHz band of room temperature noise will produce -174+30=-144 dBm, so with Mixer 1 at -125 dBm, Mixer 2 input (-140 dBm) would almost be at the noise level, and the Mixer 2 output (-146 dBm) would be beneath the noise level.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Lin,
> I've never been asked that question, and it is a good one.
> All mixers will operate down to theoretical noise floor. If the conversions loss of a mixer is -6.5 dB, then the smallest signal that can be converted is -174 + 6.5 = -167.5 dBm.
> Â Perhaps someone out there is using liquid helium and getting better results, but that's the best we can do at room temperature.
> Scotty
>
> --- On Tue, 12/13/11, inlinebeginner <inlinebeginner@...> wrote:
>
> From: inlinebeginner <inlinebeginner@...>
> Subject: [spectrumanalyzer] Re: Mixer 1 maximum input power
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, December 13, 2011, 8:40 PM
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> Scotty
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> Thanks for the infor. For this mixer, at which power level it stops working? If I try to input a -125dBm at its input, does it still response? The output would be -132dBm, which is very low.
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> Thanks
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> Lin
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> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
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> > Hi Lin,
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> > It did at one time. They have been changing their data sheets over the last few years. It is 50 mw, any port (+17 dBm), max power without damage.
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> > Scotty
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> > --- On Tue, 12/13/11, inlinebeginner <inlinebeginner@> wrote:
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> > From: inlinebeginner <inlinebeginner@>
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> > Subject: [spectrumanalyzer] Mixer 1 maximum input power
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> > To: spectrumanalyzer@yahoogroups.com
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> > Date: Tuesday, December 13, 2011, 11:41 AM
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> > ADE-11X spec does not say how much power we can apply to R and I port. You swapped the I and R as Mixer 1, in this case, if we apply 0dBm at MSA input, does this mixer work properly? The Spec does say P1dB = +1dBm.
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> > Thanks
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> > Lin
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8936. Re: Mixer 1 maximum input power

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 16:26:18 UTC
From: inlinebeginner
Topic: 8912 Message: 8936

The SA I am using can reach -140dBm with a 1 HZ RBW filter. If I get time, I would measure it.
For low power, I think the mixer should work at -167dBm like Scotty said. However, we could not directly verify it due to the equipment sensitivity. Maybe we can use a amplifier with known NF and gain and put it in front of my SA, with a 20dB gain and 3.3dB NF LNA would see this signal.
The difficulty would be how to create a -167dBm tone.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Lin,
> Consider this: Mixer 2 presently operates with roughly 15 dB less input than Mixer 1. The MSA is operating fine with inputs of -110 dBm, which means Mixer 2 is operating fine with input of -125 dBm. Which means Mixer 1 would also operate at -125 dBm. In reality, the lower limit of usefulness is not whether the mixers produce a response, but the amount of noise that gets added later. Just a 1 kHz band of room temperature noise will produce -174+30=-144 dBm, so with Mixer 1 at -125 dBm, Mixer 2 input (-140 dBm) would almost be at the noise level, and the Mixer 2 output (-146 dBm) would be beneath the noise level.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> >
> > Hi Lin,
> > I've never been asked that question, and it is a good one.
> > All mixers will operate down to theoretical noise floor. If the conversions loss of a mixer is -6.5 dB, then the smallest signal that can be converted is -174 + 6.5 = -167.5 dBm.
> > Â Perhaps someone out there is using liquid helium and getting better results, but that's the best we can do at room temperature.
> > Scotty
> >
> > --- On Tue, 12/13/11, inlinebeginner <inlinebeginner@> wrote:
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> > From: inlinebeginner <inlinebeginner@>
> > Subject: [spectrumanalyzer] Re: Mixer 1 maximum input power
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Tuesday, December 13, 2011, 8:40 PM
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> > Scotty
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> > Thanks for the infor. For this mixer, at which power level it stops working? If I try to input a -125dBm at its input, does it still response? The output would be -132dBm, which is very low.
> >
> > Thanks
> >
> > Lin
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> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
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> >
> > > Hi Lin,
> >
> > > It did at one time. They have been changing their data sheets over the last few years. It is 50 mw, any port (+17 dBm), max power without damage.
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> > > Scotty
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> > > --- On Tue, 12/13/11, inlinebeginner <inlinebeginner@> wrote:
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> > > From: inlinebeginner <inlinebeginner@>
> >

> > > Subject: [spectrumanalyzer] Mixer 1 maximum input power
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> > > To: spectrumanalyzer@yahoogroups.com
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> > > ADE-11X spec does not say how much power we can apply to R and I port. You swapped the I and R as Mixer 1, in this case, if we apply 0dBm at MSA input, does this mixer work properly? The Spec does say P1dB = +1dBm.
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8937. Re: [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 20:52:34 UTC
From: Geoff Moore
Topic: 8925 Message: 8937

Neal,

I've just been looking at the SAW filter folder to refresh my memory of parts required but I cannot see the PCB layout or values for the suggested pads.

Am I looking in the wrong place or will this info be put in the folder before we all get our soldering irons hot.

Judging by the response, you are going to be very busy in the next few weeks.

Geoff

8938. Re: SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 23:10:26 UTC
From: Sam
Topic: 8925 Message: 8938

The pads are specified as 3 dB, so take your pick:

300-18-300 ohms (3.0 dB)
270-18-270 (3.2 dB)
270-15-270 (2.9 dB)

All of these give good return loss (>30).

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Geoff Moore" <m0ore@...> wrote:
>
> Neal,
>
> I've just been looking at the SAW filter folder to refresh my memory of
> parts required but I cannot see the PCB layout or values for the suggested
> pads.
>
> Am I looking in the wrong place or will this info be put in the folder
> before we all get our soldering irons hot.
>
> Judging by the response, you are going to be very busy in the next few
> weeks.
>
> Geoff
>

8939. Lin's Single cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 23:28:18 UTC
From: Len
Topic: 8939 Message: 8939

Hello Lin

Could you please post a photo of this device?

To the group:

As a coax size reduction attempt.

I was thinking of building a single cavity with the 2 x SMA coming out of the base plate not the sides.

With the hair pins terminating in the wall at the hole position where the SMA normally mounts.

Does the hair pin operation care which end is which? Any gurus want to shoot this idea down?

Regards

Len Spyker

8940. Re: [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-14 23:54:13 UTC
From: Neal
Topic: 8925 Message: 8940

Geoff,

All the details are here:

http://www.scottyspectrumanalyzer.com/slim_sfa_1013.html

Neal

From: Geoff Moore
Sent: Wednesday, December 14, 2011 12:52 PM
To: spectrumanalyzer@yahoogroups.com
Subject: Re: [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Neal,

I've just been looking at the SAW filter folder to refresh my memory of parts required but I cannot see the PCB layout or values for the suggested pads.

Am I looking in the wrong place or will this info be put in the folder before we all get our soldering irons hot.

Judging by the response, you are going to be very busy in the next few weeks.

Geoff

8941. Re: RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next S tep

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 00:00:10 UTC
From: Neal
Topic: 8933 Message: 8941

Hi Marc,

This has gotten to be a very large exercise, so I had to make several simplifications to make things manageable. Additionally, several of the group members I talked to already had ERA-33SMs and did not want additional units.
MiniCircuits in the USA does accept “per unit” orders for the amplifier as well. Once again, I am sorry that I am not able to include an amplifier.

Do you still want to be on the list for the 1 set you requested?

Neal

From: Marc OLANIE
Sent: Tuesday, December 13, 2011 11:52 PM
To: spectrumanalyzer@yahoogroups.com
Subject: RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Hi Neal

Wouldn't it be possible to add the mmic in the SAW devices list ? Finding an ERA33 is quite impossible in Europe if you don't pass your order to Mini-Circuits UK, and I doubt they will accept selling such a device on a "per unit" basis. (without mentioning the fact that the S&H cost will be 20 Euros.. almost the cost of the Saw filter and many times the cost of the mmic itself)

And again, thank you for your time and energy.

Marc

A good working kernel is not supposed to crash unless it says "please"
(traduction : Da Power, Fantudjûû ! RuleZ Tartiflette !)

De: mailto:spectrumanalyzer%40yahoogroups.com de la part de nealmartini
Date: mer. 14/12/2011 01:38
À: mailto:spectrumanalyzer%40yahoogroups.com
Objet : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

All,

As I am sure you have observed, the group interest SAW Based 1013 MHz filter is quite high. It is now time to take the next steps in our process to make this happen. Since the requested numbers are so high, please follow the steps below to help keep the process as simple as possible so it doesn't become a part time job for me.

Here's your to do list:

1.Don't send money yet! I still am waiting for SAW quote data and shipping cost refinements. The cost for 3 SAWs and 1 PCB shipped to you should be < $18 in for US and < $21 International.

2.Please send me a direct email (mailto:nealmartini%40cableone.net) with the following information:

*Your DIRECT email address.

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*If you are outside the US, please indicate if you would be willing to be a shipping destination for participants in your region to help simplify customs and minimize shipping costs. You will be given the $ to pay for the shipping costs.

Please send the above email by December 22nd. At that point I will have firmed up costs and will send out instructions on where to PayPal money.

Thanks for your cooperation on this!

Neal

Yahoo! Groups Links

8942. Re: [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 00:07:05 UTC
From: Neal
Topic: 8925 Message: 8942

Geoff,

Look here:

http://www.scottyspectrumanalyzer.com/slim_sfa_1013.html

Neal

From: Geoff Moore
Sent: Wednesday, December 14, 2011 12:52 PM
To: spectrumanalyzer@yahoogroups.com
Subject: Re: [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Neal,

I've just been looking at the SAW filter folder to refresh my memory of parts required but I cannot see the PCB layout or values for the suggested pads.

Am I looking in the wrong place or will this info be put in the folder before we all get our soldering irons hot.

Judging by the response, you are going to be very busy in the next few weeks.

Geoff

8943. Re: Lin's Single cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 00:52:21 UTC
From: Sam
Topic: 8939 Message: 8943

Len,
In many of my experimental cavity filters, I had the coax coming out the base plate, and it works fine. You are just reversing the grounding connection and the in or out connection. I suppose this reverses the phase, but you do it on both input and output so even that change cancels out.

I also had the ground connection stick out the side, so I could adjust coupling by heating the connection and pulling or pushing the wire to make the loop come closer to the wall or go further away (I didn't use spacers). My main concern was whether the coax got blasted with excess heat when you solder the base plat on. That didn't seem to be a problem, though I also used fairly thin base plates so I didn't need as much heat.

It is certainly worth a try.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Len" <redmond2@...> wrote:
>
> Hello Lin
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> Could you please post a photo of this device?
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>
> To the group:
>
> As a coax size reduction attempt.
>
> I was thinking of building a single cavity with the 2 x SMA coming out of
> the base plate not the sides.
>
> With the hair pins terminating in the wall at the hole position where the
> SMA normally mounts.
>
> Does the hair pin operation care which end is which? Any gurus want to shoot
> this idea down?
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>
> Regards
>
> Len Spyker
>

8944. Re: [spectrumanalyzer] Lin's Single cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 01:08:55 UTC
From: william sprowls
Topic: 8939 Message: 8944

Hi Len,
The hair pin doesn't care. It simply must be some form of closed loop.
Scotty

--- On Wed, 12/14/11, Len <redmond2@...> wrote:

From: Len <redmond2@...>
Subject: [spectrumanalyzer] Lin's Single cavity filter
To: spectrumanalyzer@yahoogroups.com
Date: Wednesday, December 14, 2011, 5:28 PM

Hello Lin Could you please post a photo of this device? To the group: As a coax size reduction attempt.I was thinking of building a single cavity with the 2 x SMA coming out of the base plate not the sides.With the hair pins terminating in the wall at the hole position where the SMA normally mounts.Does the hair pin operation care which end is which? Any gurus want to shoot this idea down? RegardsLen Spyker

8945. Re: Lin's Single cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 01:11:56 UTC
From: Sam
Topic: 8939 Message: 8945

Len,
I should also add that I did some with the connector coming out the side, but I used a panel-mount SMA connector. If you attach a right-angle cable connector to this, you save a bit of space. Plus, you don't have the problem that if you bend and re-bend the coax connector to relocate your cavity, you don't crack the shield.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Len,
> In many of my experimental cavity filters, I had the coax coming out the base plate, and it works fine. You are just reversing the grounding connection and the in or out connection. I suppose this reverses the phase, but you do it on both input and output so even that change cancels out.
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> I also had the ground connection stick out the side, so I could adjust coupling by heating the connection and pulling or pushing the wire to make the loop come closer to the wall or go further away (I didn't use spacers). My main concern was whether the coax got blasted with excess heat when you solder the base plat on. That didn't seem to be a problem, though I also used fairly thin base plates so I didn't need as much heat.
>
> It is certainly worth a try.
>
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, "Len" <redmond2@> wrote:
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> > Could you please post a photo of this device?
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> > To the group:
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> > As a coax size reduction attempt.
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> > I was thinking of building a single cavity with the 2 x SMA coming out of
> > the base plate not the sides.
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> > With the hair pins terminating in the wall at the hole position where the
> > SMA normally mounts.

> >
> > Does the hair pin operation care which end is which? Any gurus want to shoot
> > this idea down?
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> > Regards
> >
> > Len Spyker
> >
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8946. Re: [spectrumanalyzer] Lin's Single cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 01:12:31 UTC
From: Jim Hontoria
Topic: 8939 Message: 8946

Hi Len
If the loop comes back to the be grounded at the SMA itself then you can
turn the SMA to vary the coupling.

Jim W1JGH

On Wed, Dec 14, 2011 at 8:08 PM, william sprowls <wsprowls@...> wrote:

> **
>
>
> Hi Len,
> The hair pin doesn't care. It simply must be some form of closed loop.
> Scotty
>
> --- On *Wed, 12/14/11, Len <redmond2@...>* wrote:
>
>
> From: Len <redmond2@...>
> Subject: [spectrumanalyzer] Lin's Single cavity filter
> To: spectrumanalyzer@yahoogroups.com
> Date: Wednesday, December 14, 2011, 5:28 PM
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> Hello Lin
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> Could you please post a photo of this device?
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> With the hair pins terminating in the wall at the hole position where the
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> Does the hair pin operation care which end is which? Any gurus want to
> shoot this idea down?
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> Regards
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> Len Spyker
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Jim G. Hontoria

8947. Re: RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next S tep

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 02:18:11 UTC
From: w4zcb
Topic: 8933 Message: 8947

I've got a bunch, I'll send Marc one. REmind me when you need it
Marc.

W4ZCB

Hi Marc,

This has gotten to be a very large exercise, so I had to make several
simplifications to make things manageable. Additionally, several of
the group members I talked to already had ERA-33SMs and did not want
additional units.
MiniCircuits in the USA does accept “per unit” orders for the
amplifier as well. Once again, I am sorry that I am not able to
include an amplifier.

Do you still want to be on the list for the 1 set you requested?

Neal

From: Marc OLANIE
Sent: Tuesday, December 13, 2011 11:52 PM
To: spectrumanalyzer@yahoogroups.com
Subject: RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next
Step

Hi Neal

Wouldn't it be possible to add the mmic in the SAW devices list ?
Finding an ERA33 is quite impossible in Europe if you don't pass your
order to Mini-Circuits UK, and I doubt they will accept selling such a
device on a "per unit" basis. (without mentioning the fact that the
S&H cost will be 20 Euros.. almost the cost of the Saw filter and many
times the cost of the mmic itself)

And again, thank you for your time and energy.

Marc

A good working kernel is not supposed to crash unless it says "please"
(traduction : Da Power, Fantudjûû ! RuleZ Tartiflette !)

De: mailto:spectrumanalyzer%40yahoogroups.com de la part de
nealmartini
Date: mer. 14/12/2011 01:38
À: mailto:spectrumanalyzer%40yahoogroups.com
Objet : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

All,

As I am sure you have observed, the group interest SAW Based 1013 MHz filter is quite high. It is now time to take the next steps in our process to make this happen. Since the requested numbers are so high, please follow the steps below to help keep the process as simple as possible so it doesn't become a part time job for me.

Here's your to do list:

1.Don't send money yet! I still am waiting for SAW quote data and shipping cost refinements. The cost for 3 SAWs and 1 PCB shipped to you should be < $18 in for US and < $21 International.

2.Please send me a direct email (mailto:nealmartini%40cableone.net) with the following information:

*Your DIRECT email address.

*The number of sets of parts you want (1 set = 3 SAWs + PCB). No separate quantities of SAWs and PCBs please.

*Your group ID (name you use for posting in this group).

*Your mailing address exactly as it should appear on a mailing package (i.e. multiple lines) so I can cut and paste it without having to split up lines.

*If you are outside the US, please indicate if you would be willing to be a shipping destination for participants in your region to help simplify customs and minimize shipping costs. You will be given the $ to pay for the shipping costs.

Please send the above email by December 22nd. At that point I will have firmed up costs and will send out instructions on where to PayPal money.

Thanks for your cooperation on this!

Neal

Yahoo! Groups Links

8948. Re: RE : [spectrumanalyzer] SAW 1013 MHz Fil ter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 03:18:33 UTC
From: william sprowls
Topic: 8933 Message: 8948

Marc and All,
The ERA-33 for the SAW project was not chosen for its particular characteristics. We are using them elsewhere in the MSA and it seemed like a logical choice. You could replace it with a variety of other MMIC amps. It just needs to have 14 to 20 dB of gain at 1013 Mhz. You would probably have to change the two 75 ohm bias resistors for whatever replacement is used.
Scotty

--- On Wed, 12/14/11, w4zcb <w4zcb@...> wrote:

From: w4zcb <w4zcb@...>
Subject: Re: RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step
To: spectrumanalyzer@yahoogroups.com
Date: Wednesday, December 14, 2011, 8:18 PM

I've got a bunch, I'll send Marc one. REmind me when you need it

Marc.

W4ZCB

Hi Marc,

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simplifications to make things manageable. Additionally, several of

the group members I talked to already had ERA-33SMs and did not want

additional units.

MiniCircuits in the USA does accept “per unit” orders for the

amplifier as well. Once again, I am sorry that I am not able to

include an amplifier.

Do you still want to be on the list for the 1 set you requested?

Neal

From: Marc OLANIE

Sent: Tuesday, December 13, 2011 11:52 PM

To: spectrumanalyzer@yahoogroups.com

Subject: RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next

Step

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And again, thank you for your time and energy.

Marc

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De: mailto:spectrumanalyzer%40yahoogroups.com de la part de nealmartini

Date: mer. 14/12/2011 01:38

À: mailto:spectrumanalyzer%40yahoogroups.com

Objet : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

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Please send the above email by December 22nd. At that point I will have firmed up costs and will send out instructions on where to PayPal money.

Thanks for your cooperation on this!

Neal

Yahoo! Groups Links

8949. Re: RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 03:42:51 UTC
From: Bill Maxwell
Topic: 8933 Message: 8949

Neal

I appreciate your position on the ERA-33SM but we had the same problem on Sam's recent Switch buy and the approach adopted then was to supply these amps only to the international buyers but to make their purchase mandatory for all such buyers. The international price was increased accordingly. All seemed happy to do that and the group buy went well. Just a thought?

Bill

On 15/12/2011 11:00 AM, Neal wrote:
>
>
> Hi Marc,
> This has gotten to be a very large exercise, so I had to make several
> simplifications to make things manageable. Additionally, several of
> the group members I talked to already had ERA-33SMs and did not want
> additional units.
> MiniCircuits in the USA does accept “per unit” orders for the
> amplifier as well. Once again, I am sorry that I am not able to
> include an amplifier.
> Do you still want to be on the list for the 1 set you requested?
> Neal
> *From:* Marc OLANIE <mailto:Marc.olanie@...>
> *Sent:* Tuesday, December 13, 2011 11:52 PM
> *To:* spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer@yahoogroups.com>
> *Subject:* RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step
>
> Hi Neal
>
> Wouldn't it be possible to add the mmic in the SAW devices list ?
> Finding an ERA33 is quite impossible in Europe if you don't pass your
> order to Mini-Circuits UK, and I doubt they will accept selling such a
> device on a "per unit" basis. (without mentioning the fact that the
> S&H cost will be 20 Euros.. almost the cost of the Saw filter and many
> times the cost of the mmic itself)
>
> And again, thank you for your time and energy.
>
> Marc
>
> A good working kernel is not supposed to crash unless it says "please"
> (traduction : Da Power, Fantudjûû ! RuleZ Tartiflette !)
>

>
> _____
>
> De: mailto:spectrumanalyzer%40yahoogroups.com de la part de nealmartini
> Date: mer. 14/12/2011 01:38
> À: mailto:spectrumanalyzer%40yahoogroups.com
> Objet : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step
>
> All,
>
> As I am sure you have observed, the group interest SAW Based 1013 MHz
> filter is quite high. It is now time to take the next steps in our
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> please follow the steps below to help keep the process as simple as
> possible so it doesn't become a part time job for me.
>
> Here's your to do list:
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> 2.Please send me a direct email (mailto:nealmartini%40cableone.net)
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> *Your DIRECT email address.
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> *Your mailing address exactly as it should appear on a mailing package
> (i.e. multiple lines) so I can cut and paste it without having to
> split up lines.
>
> *If you are outside the US, please indicate if you would be willing to
> be a shipping destination for participants in your region to help
> simplify customs and minimize shipping costs. You will be given the $
> to pay for the shipping costs.
>
> Please send the above email by December 22nd. At that point I will
> have firmed up costs and will send out instructions on where to PayPal
> money.
>
> Thanks for your cooperation on this!
>
> Neal
>
> ------------------------------------

>
> Yahoo! Groups Links
>
>
>
>

I use BullGuard Spamfilter to keep my inbox clean.
It is completely free: www.bullguard.com/freespamfilter

8950. RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 06:20:00 UTC
From: f1apy@sfr.fr
Topic: 8950 Message: 8950

Hello all,

mini-circuit UK send it by 10 , cost 19,20 € + shipping charges.

@ Marc, on peu faire un achat groupé pour les F, j'envisage de les commander fin de semaine.

Regards,

Jacques - F1APY

-----Message d'origine-----

De : spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] De la part de Marc OLANIE

Envoyé : mercredi 14 décembre 2011 08:52

À : spectrumanalyzer@yahoogroups.com

Objet : RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Hi Neal

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And again, thank you for your time and energy.

Marc

A good working kernel is not supposed to crash unless it says "please"

(traduction : Da Power, Fantudjûû ! RuleZ Tartiflette !)

De: spectrumanalyzer@yahoogroups.com de la part de nealmartini

Date: mer. 14/12/2011 01:38

À: spectrumanalyzer@yahoogroups.com

Objet : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

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Please send the above email by December 22nd. At that point I will have firmed up costs and will send out instructions on where to PayPal money.

Thanks for your cooperation on this!

Neal

Yahoo! Groups Links

Tous vos emails en 1 clic avec l'application SFR Mail sur iPhone et Android - En savoir plus.

8951. RE: RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 06:44:10 UTC
From: F4CNY
Topic: 8950 Message: 8951

Hello Jacques and all !!

It's perfect for me. ;)

Regards,

Ennio
F4CNY
-----Message d'origine-----
De : spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com]De la part de f1apy@...
Envoyé : jeudi 15 décembre 2011 07:20
À : spectrumanalyzer@yahoogroups.com
Objet : RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Hello all,

mini-circuit UK send it by 10 , cost 19,20 € + shipping charges.

@ Marc, on peu faire un achat groupé pour les F, j'envisage de les commander fin de semaine.

Regards,

Jacques - F1APY

-----Message d'origine-----

De : spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] De la part de Marc OLANIE

Envoyé : mercredi 14 décembre 2011 08:52

À : spectrumanalyzer@yahoogroups.com

Objet : RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

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Marc

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De: spectrumanalyzer@yahoogroups.com de la part de nealmartini

Date: mer. 14/12/2011 01:38

À: spectrumanalyzer@yahoogroups.com

Objet : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

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Thanks for your cooperation on this!

Neal

Yahoo! Groups Links

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8952. RE: RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next S tep

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 08:28:09 UTC
From: michel pacquelin
Topic: 8933 Message: 8952

Hi Neal

Avez-vous reçu ma demande ?

Did you receive my request?

je ne parle pas anglais je m en excuse

1 ensemble pour moi (3 saw , pcb .....)

livraison en france

règlement via paypal dès que vous m indiquez le prix

1 set for me (3 saw, pcb .....)
Delivery in France
regulation via paypal as soon as you enter the price m

id yahoo f1chm

pacquelin michel

1 rue de voinin

02200 pasly france

cordialement michel <mailto:f1chm@...> f1chm@...

De : spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com] De la part de Neal
Envoyé : jeudi 15 décembre 2011 01:00
À : spectrumanalyzer@yahoogroups.com
Objet : Re: RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Hi Marc,

This has gotten to be a very large exercise, so I had to make several simplifications to make things manageable. Additionally, several of the group members I talked to already had ERA-33SMs and did not want additional units.

MiniCircuits in the USA does accept “per unit” orders for the amplifier as well. Once again, I am sorry that I am not able to include an amplifier.

Do you still want to be on the list for the 1 set you requested?

Neal

From: Marc OLANIE <mailto:Marc.olanie@...>

Sent: Tuesday, December 13, 2011 11:52 PM

To: spectrumanalyzer@yahoogroups.com

Subject: RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Hi Neal

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De: mailto:spectrumanalyzer%40yahoogroups.com de la part de nealmartini
Date: mer. 14/12/2011 01:38
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Thanks for your cooperation on this!

Neal

Yahoo! Groups Links

8953. RE: RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 09:44:03 UTC
From: marc olanié
Topic: 8950 Message: 8953

Hi Jacques and ennio

It’s ok for me too. I have some ERA & MAR in my junkbox, but the noise factor of those are far higher than the one of the ERA33.

I’ll be ok for at leat 3 or 5 pieces (one for the SAW, two for the HF amp, and 2 for the road)

And don’t worry, Jacques, nothing is urgent right now J

Marc f6itu

Hello Jacques and all !!

It's perfect for me. ;)

Regards,

Ennio

F4CNY

-----Message d'origine-----
De : <mailto:spectrumanalyzer@yahoogroups.com> spectrumanalyzer@yahoogroups.com [mailto:spectrumanalyzer@yahoogroups.com]De la part de f1apy@...
Envoyé : jeudi 15 décembre 2011 07:20
À : spectrumanalyzer@yahoogroups.com
Objet : RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

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Jacques - F1APY

-----Message d'origine-----

De : <mailto:spectrumanalyzer@yahoogroups.com> spectrumanalyzer@yahoogroups.com [<mailto:spectrumanalyzer@yahoogroups.com> mailto:spectrumanalyzer@yahoogroups.com] De la part de Marc OLANIE

Envoyé : mercredi 14 décembre 2011 08:52

À : <mailto:spectrumanalyzer@yahoogroups.com> spectrumanalyzer@yahoogroups.com

Objet : RE : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

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(traduction : Da Power, Fantudjûû ! RuleZ Tartiflette !)

De: <mailto:spectrumanalyzer@yahoogroups.com> spectrumanalyzer@yahoogroups.com de la part de nealmartini

Date: mer. 14/12/2011 01:38

À: <mailto:spectrumanalyzer@yahoogroups.com> spectrumanalyzer@yahoogroups.com

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Thanks for your cooperation on this!

Neal

Yahoo! Groups Links

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8955. Re: Lin's Single cavity filter

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 15:23:33 UTC
From: inlinebeginner
Topic: 8939 Message: 8955

Len
The single cavity structure is identical as Scotty's original cavity filter. I only changed the stub to a threaded stub and tune from bottom with a nut tight it. Later once I get more time, I will do some test to see if we can optimize the rejection and insertion loss.
Thanks
Lin

--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> Hi Len
> If the loop comes back to the be grounded at the SMA itself then you can
> turn the SMA to vary the coupling.
>
> Jim W1JGH
>
> On Wed, Dec 14, 2011 at 8:08 PM, william sprowls <wsprowls@...> wrote:
>
> > **
> >
> >
> > Hi Len,
> > The hair pin doesn't care. It simply must be some form of closed loop.
> > Scotty
> >
> > --- On *Wed, 12/14/11, Len <redmond2@...>* wrote:
> >
> >
> > From: Len <redmond2@...>
> > Subject: [spectrumanalyzer] Lin's Single cavity filter
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Wednesday, December 14, 2011, 5:28 PM
> >
> >
> >
> > Hello Lin
> >
> >
> >
> > Could you please post a photo of this device?
> >
> >
> >
> > To the group:
> >
> > As a coax size reduction attempt.

> >
> > I was thinking of building a single cavity with the 2 x SMA coming out of
> > the base plate not the sides.
> >
> > With the hair pins terminating in the wall at the hole position where the
> > SMA normally mounts.
> >
> > Does the hair pin operation care which end is which? Any gurus want to
> > shoot this idea down?
> >
> >
> >
> > Regards
> >
> > Len Spyker
> >
> >
> >
> >
> >
> >
> >
> >
> >
>
>
>
> --
> Jim G. Hontoria
>

8956. SAW group buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 15:25:50 UTC
From: Sam
Topic: 8956 Message: 8956

I suggest that all further messages for Neal on the SAW group buy go directly to Neal by email, other than messages of general interest. We already have a mass of messages indicating interest; we don't need another mass providing postal addresses.

Two points on the ERA--First, per a prior posting, the LEE-39 is probably better for this purpose--lower noise, lower P1dB and higher gain. Second, maybe it would make sense for someone to do a separate group buy. Rather than people trying to find one ERA for each project, it would make sense to buy 10 and be done with it. Otherwise, the person doing the group buy will get some orders for 1, some for 5, some for 10, etc.

Sam W.

8957. SAW filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 17:08:10 UTC
From: ed_k7ock
Topic: 8957 Message: 8957

Hello Neal,

I am not sure that my previous email with this information was sent, so I am sending again. Please excuse if you have already gotten the information

2.Please send me a direct email (nealmartini@...) with the following information:

*Your DIRECT email address.

ed_gunderson@...

*The number of sets of parts you want (1 set = 3 SAWs + PCB). No separate quantities of SAWs and PCBs please.

2 sets

*Your group ID (name you use for posting in this group).

ed_k7ock

*Your mailing address exactly as it should appear on a mailing package (i.e. multiple lines) so I can cut and paste it without having to split up lines.

Ed Gunderson
19440 E Ithaca Pl
Aurora, CO 80013

Thanks again for the design and group buy.

Ed Gunderson K7OCK

8958. RE: [spectrumanalyzer] Amplifier group buy,for SAW filter.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 17:28:26 UTC
From: Staines, Stephen
Topic: 8958 Message: 8958

I would be willing to organise a group buy of ERA-33SM+ or LEE-39+. LEE-39+ is as Sam mentions probably the better option, but the package is FG873 as opposed to the ERA-33SM+ which is WW107. This may represent soldering issues for some and PCB design issues for the SAW filter board, please come back to me on this one.
My company has an account with Mini-Circuits so a small discount can be passed on. I also think that 10 should be the minimum order or multiples of 10.
Do not show your interest buy posting to the group list, I will give my direct email when a decision is made regarding the choice of Amplifier.
The cost would be parts+ tax at 20% + Jiffy bag + large letter post cost and no profit to me.
I would want payment before ordering, and will not be held responsible the any loss due to post issues. Addressing and posting will be done with the upmost care. I have taken advantage of a number of group buys from various yahoo groups so thought I should show willing.
Regards
Steve g7was.

_____
From: spectrumanalyzer@yahoogroups.com [spectrumanalyzer@yahoogroups.com] on behalf of Sam [swetterlin@comcast.net]
Sent: 15 December 2011 15:25
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] SAW group buy

I suggest that all further messages for Neal on the SAW group buy go directly to Neal by email, other than messages of general interest. We already have a mass of messages indicating interest; we don't need another mass providing postal addresses.

Two points on the ERA--First, per a prior posting, the LEE-39 is probably better for this purpose--lower noise, lower P1dB and higher gain. Second, maybe it would make sense for someone to do a separate group buy. Rather than people trying to find one ERA for each project, it would make sense to buy 10 and be done with it. Otherwise, the person doing the group buy will get some orders for 1, some for 5, some for 10, etc.

Sam W.

8959. Re: [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 17:36:11 UTC
From: Geoff Moore
Topic: 8925 Message: 8959

Thanks Neal, I was looking in the files section on the group.

Geoff

----- Original Message -----
From: "Neal" <nealmartini@...>
To: <spectrumanalyzer@yahoogroups.com>
Sent: Wednesday, December 14, 2011 11:54 PM
Subject: Re: [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Geoff,

All the details are here:

http://www.scottyspectrumanalyzer.com/slim_sfa_1013.html

Neal

From: Geoff Moore
Sent: Wednesday, December 14, 2011 12:52 PM
To: spectrumanalyzer@yahoogroups.com
Subject: Re: [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

Neal,

I've just been looking at the SAW filter folder to refresh my memory of parts required but I cannot see the PCB layout or values for the suggested pads.

Am I looking in the wrong place or will this info be put in the folder before we all get our soldering irons hot.

Judging by the response, you are going to be very busy in the next few weeks.

Geoff

8960. RE: [spectrumanalyzer] Amplifier group buy,for SAW filter.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 18:04:51 UTC
From: william sprowls
Topic: 8958 Message: 8960

Hi Steve,
The LEE series with package FG873 will fit on the current layouts using the ERA-33. For those with steady hands and good eyes, soldering should not be a problem. For others, it might be prudent to trim back the input and output trace to provide a bit more space to prevent solder bridging.
Scotty

--- On Thu, 12/15/11, Staines, Stephen <s.staines@...> wrote:

> From: Staines, Stephen <s.staines@...>
> Subject: RE: [spectrumanalyzer] Amplifier group buy,for SAW filter.
> To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
> Date: Thursday, December 15, 2011, 11:28 AM
> I would be willing to organise a
> group buy of ERA-33SM+ or LEE-39+. LEE-39+ is as Sam
> mentions probably the better option, but the package is
> FG873 as opposed to the ERA-33SM+ which is WW107. This may
> represent soldering issues for some and PCB design issues
> for the SAW filter board, please come back to me on this
> one.
> My company has an account with Mini-Circuits so a small
> discount can be passed on. I also think that 10 should be
> the minimum order or multiples of 10.
> Do not show your interest buy posting to the group list, I
> will give my direct email when a decision is made regarding
> the choice of Amplifier.
> The cost would be parts+ tax at 20% + Jiffy bag + large
> letter post cost and no profit to me.
> I would want payment before ordering, and will not be held
> responsible the any loss due to post issues. Addressing and
> posting will be done with the upmost care. I have taken
> advantage of a number of group buys from various yahoo
> groups so thought I should show willing.
> Regards
> Steve g7was.
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> _____
> From: spectrumanalyzer@yahoogroups.com
> [spectrumanalyzer@yahoogroups.com]
> on behalf of Sam [swetterlin@...]

> Sent: 15 December 2011 15:25
> To: spectrumanalyzer@yahoogroups.com
> Subject: [spectrumanalyzer] SAW group buy
>
>
>
> I suggest that all further messages for Neal on the SAW
> group buy go directly to Neal by email, other than messages
> of general interest. We already have a mass of messages
> indicating interest; we don't need another mass providing
> postal addresses.
>
> Two points on the ERA--First, per a prior posting, the
> LEE-39 is probably better for this purpose--lower noise,
> lower P1dB and higher gain. Second, maybe it would make
> sense for someone to do a separate group buy. Rather than
> people trying to find one ERA for each project, it would
> make sense to buy 10 and be done with it. Otherwise, the
> person doing the group buy will get some orders for 1, some
> for 5, some for 10, etc.
>
> Sam W.
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> ---
>
> Yahoo! Groups Links
>
>
> spectrumanalyzer-fullfeatured@yahoogroups.com
>
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8961. Re: Amplifier group buy,for SAW filter.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 20:12:41 UTC
From: Sam
Topic: 8958 Message: 8961

It appears to me that the LEE package is what you would get if you embedded an ERA in a square plastic package that is slightly larger than the ERA pill shape, with the leads running to the corners of the square. The other difference is that the two ground leads are connected on the bottom of the package with a metal strip. As Scotty points out, there is a risk that the bottom strip would get soldered to the input or output pads if you don't align it perfectly, so trimming those pads is a good idea.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Steve,
> The LEE series with package FG873 will fit on the current layouts using the ERA-33. For those with steady hands and good eyes, soldering should not be a problem. For others, it might be prudent to trim back the input and output trace to provide a bit more space to prevent solder bridging.
> Scotty
>
> --- On Thu, 12/15/11, Staines, Stephen <s.staines@...> wrote:
>
> > From: Staines, Stephen <s.staines@...>
> > Subject: RE: [spectrumanalyzer] Amplifier group buy,for SAW filter.
> > To: "spectrumanalyzer@yahoogroups.com" <spectrumanalyzer@yahoogroups.com>
> > Date: Thursday, December 15, 2011, 11:28 AM
> > I would be willing to organise a
> > group buy of ERA-33SM+ or LEE-39+. LEE-39+ is as Sam
> > mentions probably the better option, but the package is
> > FG873 as opposed to the ERA-33SM+ which is WW107. This may
> > represent soldering issues for some and PCB design issues
> > for the SAW filter board, please come back to me on this
> > one.
> > My company has an account with Mini-Circuits so a small
> > discount can be passed on. I also think that 10 should be
> > the minimum order or multiples of 10.
> > Do not show your interest buy posting to the group list, I
> > will give my direct email when a decision is made regarding
> > the choice of Amplifier.
> > The cost would be parts+ tax at 20% + Jiffy bag + large
> > letter post cost and no profit to me.
> > I would want payment before ordering, and will not be held
> > responsible the any loss due to post issues. Addressing and
> > posting will be done with the upmost care. I have taken
> > advantage of a number of group buys from various yahoo
> > groups so thought I should show willing.
> > Regards
> > Steve g7was.

> >

8962. Amp Group buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 21:28:37 UTC
From: s.staines@cranfield.ac.uk
Topic: 8962 Message: 8962

If you wish to participate in the Amp group buy take note of Scotty and Sam's previous messages. Based on this info make your choice, personally I will go for the LEE amp
Send your request to this email g7wasgroupbuy @ gmail.com remove spaces around @
I would like the following info
1/ the number of lots of 10 you want. (Minimum order 10)
2/ which amp ERA or LEE, or the number of lots of each.
3/ your country of residence, so I can work out a list of postage costs.
Rough cost for 1 lot of 10 ERA amps inc package is going to be in the order of UK £17.65
Rough cost for 1 lot of 10 LEE amps inc package is going to be in the order of UK £12.10
This is base on a price break point of 100 units so as long as an order of £50 is achieved there is no delivery charge.
Postage is location dependent but UK large letter delivery is less than £1 I believe Royal mail price finder Webb page is down. Also not sure about Pay Pal charges, I think personal gift might be the method to use!
If you have any comments/suggestion or can find a cheaper source please say

8963. Re: Noise Experiment

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-15 22:39:00 UTC
From: Sam
Topic: 8913 Message: 8963

Scotty,
I just picked up on your message. My amp seemed to function fine, and I think it handles fairly high power. I definitely got more output as I increased the input level. It's crazy to use a 30 dB amp and attenuate it down to 10 dB, but that is the only canned low noise amp I have. If I permanently implement this, I will use an amp with lower gain.

Also, some additional info. When I did the amp test, the signals seemed surprisingly noisy even with a heavy video filter. I thought maybe I was mis-remembering what the low level noise should look like, so I went ahead with the test. Today I realized that the video filter was not being automatically set, because in a software experiment a while ago I reconfigured and told the software I did not have the automatic video filter. So I configured correctly and the noise went away. I can't tell you how much time I wasted diagnosing this (suspecting Latch 4, etc.) before I realized it was a configuration problem.

With the greatly reduced noise and a 600 Hz RBW, my minimum visible signal was -115 dBm before adding the amp, and -124 dBm with the amp. And I wasn't stretching it--the -124 dBm signal was perfectly obvious on every scan when using the XNarrow filter. It came and went when using the Narrow filter.

Lin, on the question of whether the mixers operate at low level, this shows that the ADE in Mixer 1 operates at least as low as -127 dBm (-124 dBm input minus the 3 dB pad) and that Mixer 2 operates at least as low as -142 dBm. Reaching -124 dBm at the MSA input with a 600 Hz RBW is darn good when you compare it to an HP reaching -140 dBm with 1 Hz RBW.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> With an amplifier on the output of Mixer 1, consider this. Because of "fair" mixer isolation the L port power will be about 35 dB down at the R port. +7-35=-28 dBm. With a 30 dB amplifier, this is a honking +2 dBm out of the amplifier. Not knowing your flavor of amplifier, is it in saturation?
> Scotty
>
> --- On Tue, 12/13/11, Sam <swetterlin@...> wrote:
>
> From: Sam <swetterlin@...>
> Subject: [spectrumanalyzer] Noise Experiment
> To: spectrumanalyzer@yahoogroups.com
> Date: Tuesday, December 13, 2011, 1:05 PM
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> As Harold said, one experiment is worth a thousand expert opinions, so I did an experiment with an amplifier in front of my cavity filter. Just an amp, no SAW or other additional filter.
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>
> I used a 30 dB amp with 20 dB pad on the output, for a net of 10 dB gain. The amp spec says it has NF=2.3 dB. I inserted it between my diplexer output and the cavity input. I did not recalibrate, so the display levels became meaningless, so I just looked for the "minimum visible signal", which by my definition is the minimum signal that is recognizable as a distinct signal on every scan, even though its shape keeps changing due to noise. That signal previously was about -110 dBm, so I tried a level of -120 dBm. Lo and behold, there was the signal, visible on every scan, though sometimes choppy. (Note: the minimum visible signal seems to come out about 5-8 dB above the level that shows a consistent response during calibration. You can also "cheat" by zooming in to make the signal wide, which makes it more visible. When comparing with and without amp, you just have to apply the same standards both times.)
>
>
>
> As to the high end: (I use the expanded log detector and an IF2 amp with gain of 28 dB, so others might get different results.) Up to about -10 dBm the response was very linear and then started to taper off. The change in response was still good at -5 dBm, and easily detectable but weak at 0 dBm.
>
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>
> Next step is to reduce the IF2 amp gain by a couple dB to make the response at 0 dBm a bit more solid. We'll see if that increases the minimum visible signal.

>
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>
> One downside of the amp is the possibility of IMD. But I suspect Mixer 1 is more of an IMD problem than the amp is. Still, to reduce the IMD possibilities (and maybe some spurs) I think I would at least put a low pass filter on the amp input to reduce signals at >1.5 GHz, because the LO1 harmonics are so strong. Of course, you could use a SAW as the filter, with better filtering but more loss.
>
>
>
> In short, this works quite well.
>
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>
> P.S. the above was done with RBW=600 Hz. I increased the amp to 15 dB and wasn't sure whether or not there was an improvement. Reduced it to 6 dB and things got slightly worse. I then tried it with RBW=8 kHz with the 10 dB amp and got slightly better results than at 600 Hz. How well the amp works depends in part on where the noise bottleneck is in your MSA. A certain amount of narrow band noise reaches the log detector and the log detector adds a lot of wide band noise. Once you reduce the narrow band noise enough so the wide band noise dominates, further reductions accomplish nothing.
>
>
>
> Sam W.
>

8964. My 2nd cavity filter performance, 3.98dB insertion loss

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 05:31:34 UTC
From: inlinebeginner
Topic: 8964 Message: 8964

I just build my 2nd cavity filter, the insertion loss: 3.98dB. It is much better than my 1st one built about 1.5 years ago.
The test result is here:

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/387914832/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc

The over all rejection is here:

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1777865914/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc

Photo is here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/608225844/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc

Lin

8965. Re: Amp Group buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 08:06:12 UTC
From: John
Topic: 8962 Message: 8965

Hi Steve,

1. Can you please include me for one lot (10.
2. The ERA Amp for me please.
3. Resident in UK.

Many thanks for your effort and time.

73 John G6KJK

--- In spectrumanalyzer@yahoogroups.com, s.staines@... wrote:
>
> If you wish to participate in the Amp group buy take note of Scotty and Sam's previous messages. Based on this info make your choice, personally I will go for the LEE amp
> Send your request to this email g7wasgroupbuy @ gmail.com remove spaces around @
> I would like the following info
> 1/ the number of lots of 10 you want. (Minimum order 10)
> 2/ which amp ERA or LEE, or the number of lots of each.
> 3/ your country of residence, so I can work out a list of postage costs.
> Rough cost for 1 lot of 10 ERA amps inc package is going to be in the order of UK £17.65
> Rough cost for 1 lot of 10 LEE amps inc package is going to be in the order of UK £12.10
> This is base on a price break point of 100 units so as long as an order of £50 is achieved there is no delivery charge.
> Postage is location dependent but UK large letter delivery is less than £1 I believe Royal mail price finder Webb page is down. Also not sure about Pay Pal charges, I think personal gift might be the method to use!
> If you have any comments/suggestion or can find a cheaper source please say
>

8966. Re: Amp Group buy

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 08:10:59 UTC
From: John
Topic: 8962 Message: 8966

Sorry Steve, sent in error, now sent to your stipulated address.

73 John G6KJK

--- In spectrumanalyzer@yahoogroups.com, "John" <chappell.john@...> wrote:
>
> Hi Steve,
>
> 1. Can you please include me for one lot (10.
> 2. The ERA Amp for me please.
> 3. Resident in UK.
>
> Many thanks for your effort and time.
>
> 73 John G6KJK

8967. Re: My 2nd cavity filter performance, 3.98dB insertion loss

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 12:11:36 UTC
From: Sam
Topic: 8964 Message: 8967

Lin,
Very nice. That's about as good as it gets.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> I just build my 2nd cavity filter, the insertion loss: 3.98dB. It is much better than my 1st one built about 1.5 years ago.
> The test result is here:
>
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/387914832/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
>
> The over all rejection is here:
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> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1777865914/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
>
> Photo is here:
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/608225844/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
>
> Lin
>

8968. Re: Noise Experiment

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 14:19:16 UTC
From: Sam
Topic: 8913 Message: 8968

Further results with my 10 dB amp in front of the cavity filter. Minimum visible signal levels (XNarrow video filter) with different RBW:

600 Hz -124 dBm
8 kHz -118 dBm
30 kHz -114 dBm
400 kHz -105 dBm

My standard for "visible" is that the signal is obvious and steady enough that you would be confident there is a signal there, even if you didn't know about the signal in advance. There is a bit of subjectivity in the test. I was being conservative, looking for very obvious signals, and could legitimately claim that the numbers are 1 or 2 dB better than shown above.

I am especially happy to be getting such good results at the wide bandwidths, which means I can see weak signals even when scanning broad frequency ranges.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Scotty,
> I just picked up on your message. My amp seemed to function fine, and I think it handles fairly high power. I definitely got more output as I increased the input level. It's crazy to use a 30 dB amp and attenuate it down to 10 dB, but that is the only canned low noise amp I have. If I permanently implement this, I will use an amp with lower gain.
>
> Also, some additional info. When I did the amp test, the signals seemed surprisingly noisy even with a heavy video filter. I thought maybe I was mis-remembering what the low level noise should look like, so I went ahead with the test. Today I realized that the video filter was not being automatically set, because in a software experiment a while ago I reconfigured and told the software I did not have the automatic video filter. So I configured correctly and the noise went away. I can't tell you how much time I wasted diagnosing this (suspecting Latch 4, etc.) before I realized it was a configuration problem.
>
> With the greatly reduced noise and a 600 Hz RBW, my minimum visible signal was -115 dBm before adding the amp, and -124 dBm with the amp. And I wasn't stretching it--the -124 dBm signal was perfectly obvious on every scan when using the XNarrow filter. It came and went when using the Narrow filter.
>
> Lin, on the question of whether the mixers operate at low level, this shows that the ADE in Mixer 1 operates at least as low as -127 dBm (-124 dBm input minus the 3 dB pad) and that Mixer 2 operates at least as low as -142 dBm. Reaching -124 dBm at the MSA input with a 600 Hz RBW is darn good when you compare it to an HP reaching -140 dBm with 1 Hz RBW.
>

> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> >
> > With an amplifier on the output of Mixer 1, consider this. Because of "fair" mixer isolation the L port power will be about 35 dB down at the R port. +7-35=-28 dBm. With a 30 dB amplifier, this is a honking +2 dBm out of the amplifier. Not knowing your flavor of amplifier, is it in saturation?
> > Scotty
> >
> > --- On Tue, 12/13/11, Sam <swetterlin@> wrote:
> >
> > From: Sam <swetterlin@>
> > Subject: [spectrumanalyzer] Noise Experiment
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Tuesday, December 13, 2011, 1:05 PM

> >
> > As Harold said, one experiment is worth a thousand expert opinions, so I did an experiment with an amplifier in front of my cavity filter. Just an amp, no SAW or other additional filter.
> >
> > I used a 30 dB amp with 20 dB pad on the output, for a net of 10 dB gain. The amp spec says it has NF=2.3 dB. I inserted it between my diplexer output and the cavity input. I did not recalibrate, so the display levels became meaningless, so I just looked for the "minimum visible signal", which by my definition is the minimum signal that is recognizable as a distinct signal on every scan, even though its shape keeps changing due to noise. That signal previously was about -110 dBm, so I tried a level of -120 dBm. Lo and behold, there was the signal, visible on every scan, though sometimes choppy. (Note: the minimum visible signal seems to come out about 5-8 dB above the level that shows a consistent response during calibration. You can also "cheat" by zooming in to make the signal wide, which makes it more visible. When comparing with and without amp, you just have to apply the same standards both times.)
> >
> > As to the high end: (I use the expanded log detector and an IF2 amp with gain of 28 dB, so others might get different results.) Up to about -10 dBm the response was very linear and then started to taper off. The change in response was still good at -5 dBm, and easily detectable but weak at 0 dBm.
> >
> > Next step is to reduce the IF2 amp gain by a couple dB to make the response at 0 dBm a bit more solid. We'll see if that increases the minimum visible signal.
> >
> > One downside of the amp is the possibility of IMD. But I suspect Mixer 1 is more of an IMD problem than the amp is. Still, to reduce the IMD possibilities (and maybe some spurs) I think I would at least put a low pass filter on the amp input to reduce signals at >1.5 GHz, because the LO1 harmonics are so strong. Of course, you could use a SAW as the filter, with better filtering but more loss.
> >
> > In short, this works quite well.
> >

> > P.S. the above was done with RBW=600 Hz. I increased the amp to 15 dB and wasn't sure whether or not there was an improvement. Reduced it to 6 dB and things got slightly worse. I then tried it with RBW=8 kHz with the 10 dB amp and got slightly better results than at 600 Hz. How well the amp works depends in part on where the noise bottleneck is in your MSA. A certain amount of narrow band noise reaches the log detector and the log detector adds a lot of wide band noise. Once you reduce the narrow band noise enough so the wide band noise dominates, further reductions accomplish nothing.
> >
> > Sam W.

8969. Re: Noise Experiment

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 15:37:43 UTC
From: inlinebeginner
Topic: 8913 Message: 8969

Sam
Are you using expended log detector during your test?
Thanks
Lin
--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Further results with my 10 dB amp in front of the cavity filter. Minimum visible signal levels (XNarrow video filter) with different RBW:
>
> 600 Hz -124 dBm
> 8 kHz -118 dBm
> 30 kHz -114 dBm
> 400 kHz -105 dBm
>
> My standard for "visible" is that the signal is obvious and steady enough that you would be confident there is a signal there, even if you didn't know about the signal in advance. There is a bit of subjectivity in the test. I was being conservative, looking for very obvious signals, and could legitimately claim that the numbers are 1 or 2 dB better than shown above.
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> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Scotty,
> > I just picked up on your message. My amp seemed to function fine, and I think it handles fairly high power. I definitely got more output as I increased the input level. It's crazy to use a 30 dB amp and attenuate it down to 10 dB, but that is the only canned low noise amp I have. If I permanently implement this, I will use an amp with lower gain.
> >
> > Also, some additional info. When I did the amp test, the signals seemed surprisingly noisy even with a heavy video filter. I thought maybe I was mis-remembering what the low level noise should look like, so I went ahead with the test. Today I realized that the video filter was not being automatically set, because in a software experiment a while ago I reconfigured and told the software I did not have the automatic video filter. So I configured correctly and the noise went away. I can't tell you how much time I wasted diagnosing this (suspecting Latch 4, etc.) before I realized it was a configuration problem.
> >
> > With the greatly reduced noise and a 600 Hz RBW, my minimum visible signal was -115 dBm before adding the amp, and -124 dBm with the amp. And I wasn't stretching it--the -124 dBm signal was perfectly obvious on every scan when using the XNarrow filter. It came and went

when using the Narrow filter.
> >
> > Lin, on the question of whether the mixers operate at low level, this shows that the ADE in Mixer 1 operates at least as low as -127 dBm (-124 dBm input minus the 3 dB pad) and that Mixer 2 operates at least as low as -142 dBm. Reaching -124 dBm at the MSA input with a 600 Hz RBW is darn good when you compare it to an HP reaching -140 dBm with 1 Hz RBW.
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > >
> > > With an amplifier on the output of Mixer 1, consider this. Because of "fair" mixer isolation the L port power will be about 35 dB down at the R port. +7-35=-28 dBm. With a 30 dB amplifier, this is a honking +2 dBm out of the amplifier. Not knowing your flavor of amplifier, is it in saturation?
> > > Scotty
> > >
> > > --- On Tue, 12/13/11, Sam <swetterlin@> wrote:
> > >
> > > From: Sam <swetterlin@>
> > > Subject: [spectrumanalyzer] Noise Experiment
> > > To: spectrumanalyzer@yahoogroups.com
> > > Date: Tuesday, December 13, 2011, 1:05 PM
>
> > >
> > > As Harold said, one experiment is worth a thousand expert opinions, so I did an experiment with an amplifier in front of my cavity filter. Just an amp, no SAW or other additional filter.
> > >
> > > I used a 30 dB amp with 20 dB pad on the output, for a net of 10 dB gain. The amp spec says it has NF=2.3 dB. I inserted it between my diplexer output and the cavity input. I did not recalibrate, so the display levels became meaningless, so I just looked for the "minimum visible signal", which by my definition is the minimum signal that is recognizable as a distinct signal on every scan, even though its shape keeps changing due to noise. That signal previously was about -110 dBm, so I tried a level of -120 dBm. Lo and behold, there was the signal, visible on every scan, though sometimes choppy. (Note: the minimum visible signal seems to come out about 5-8 dB above the level that shows a consistent response during calibration. You can also "cheat" by zooming in to make the signal wide, which makes it more visible. When comparing with and without amp, you just have to apply the same standards both times.)
> > >
> > > As to the high end: (I use the expanded log detector and an IF2 amp with gain of 28 dB, so others might get different results.) Up to about -10 dBm the response was very linear and then started to taper off. The change in response was still good at -5 dBm, and easily detectable but weak at 0 dBm.
> > >
> > > Next step is to reduce the IF2 amp gain by a couple dB to make the response at 0 dBm a bit more solid. We'll see if that increases the minimum visible signal.
> > >
> > > One downside of the amp is the possibility of IMD. But I suspect Mixer 1 is more of an IMD problem than the amp is. Still, to reduce the IMD possibilities (and maybe some

spurs) I think I would at least put a low pass filter on the amp input to reduce signals at >1.5 GHz, because the LO1 harmonics are so strong. Of course, you could use a SAW as the filter, with better filtering but more loss.
> > >
> > > In short, this works quite well.
> > >
> > > P.S. the above was done with RBW=600 Hz. I increased the amp to 15 dB and wasn't sure whether or not there was an improvement. Reduced it to 6 dB and things got slightly worse. I then tried it with RBW=8 kHz with the 10 dB amp and got slightly better results than at 600 Hz. How well the amp works depends in part on where the noise bottleneck is in your MSA. A certain amount of narrow band noise reaches the log detector and the log detector adds a lot of wide band noise. Once you reduce the narrow band noise enough so the wide band noise dominates, further reductions accomplish nothing.
> > >
> > > Sam W.
>

8970. Re: My 2nd cavity filter performance, 3.98dB insertion loss

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 17:02:06 UTC
From: inlinebeginner
Topic: 8964 Message: 8970

Today I measured with HP VAN, the insertion loss I got is 4.3dB. Looks like my MSA did not calibrate well above 1GHz in 1G band.
Anyway, 4.3dB is still better than 7.1dB, which is what I got on my firts cavity filter.
The interesting thing I experenced is that I disassembled this cavity filter after I first time assembled it completely. Because I saw a 20dB insertion loss. I removed the top and bottom end plates and checked hairpins, and found the center one was short to ground, due to the wrong material I used for spacers, they are melt at high temperature. I changed tje spacers and put the top and bottom end plates back, it works very well.
Lin
--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Lin,
> Very nice. That's about as good as it gets.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > I just build my 2nd cavity filter, the insertion loss: 3.98dB. It is much better than my 1st one built about 1.5 years ago.
> > The test result is here:
> >
> > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/387914832/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
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> > The over all rejection is here:
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> > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1777865914/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
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> > Photo is here:
> > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/608225844/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
> >
> > Lin
> >
>

8971. Re: [spectrumanalyzer] Re: My 2nd cavity filter performance, 3.98dB insertion loss

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 17:14:39 UTC
From: Steve
Topic: 8964 Message: 8971

Hi Lin and others,

Two questions come to mind.

First, my cavity filter (I've only constructed one) has 7-8dB of loss.
What is the trick to decreasing the loss from 7-8dB to the 4dB range?

Secondly, intuitively I understand that we'd like as low a loss as
possible in the cavity filter. How would a less lossy cavity filter
benefit or improve operation and use of the spectrum analyzer?

Thanks.

Steve K8JQ

On 12/16/2011 12:02 PM, inlinebeginner wrote:
> Today I measured with HP VAN, the insertion loss I got is 4.3dB. Looks like my MSA did not calibrate well above 1GHz in 1G band.
> Anyway, 4.3dB is still better than 7.1dB, which is what I got on my firts cavity filter.
> The interesting thing I experenced is that I disassembled this cavity filter after I first time assembled it completely. Because I saw a 20dB insertion loss. I removed the top and bottom end plates and checked hairpins, and found the center one was short to ground, due to the wrong material I used for spacers, they are melt at high temperature. I changed tje spacers and put the top and bottom end plates back, it works very well.
> Lin
> --- In spectrumanalyzer@yahoogroups.com, "Sam"<swetterlin@...> wrote:
>> Lin,
>> Very nice. That's about as good as it gets.
>> Sam W.
>>
>> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner"<inlinebeginner@> wrote:
>>> I just build my 2nd cavity filter, the insertion loss: 3.98dB. It is much better than my 1st one built about 1.5 years ago.
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8972. Re: My 2nd cavity filter performance, 3.98dB insertion loss

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 18:18:07 UTC
From: inlinebeginner
Topic: 8964 Message: 8972

Steve
How did I get 4.3dB insertion loss? I did not do it on purpose. At very begining, I think 7.1dB insertion loss would be good. But the result shows that it is 4.3dB. The difference between my 1st and 2nd cavity filter are:
1) I use thiner pipe, I don't think this is the factor. I just make the weight a little bit less.
2) I use a 1.02mm wire to do the haripin. On my first filter, I used 0.9mm wire. 10% diameter increase, 21% surfce area increase. This may be the factor.
3) Clean and tight the brass screw. This would reduce about 0.3 to 0.5dB insertion loss, from what I observed. May be I am wrong.

The less insertion loss means better (smaller) noise figure, and you will have lower noise floor, and larger dynamic range.
Any reduction of attenuation before the amplifer (or the first stage of your signal chain), will help reduce the over all noise figure. That is why we want to put an amplifer for SAW replacement,the SAW chain has much larger insertion loss without the amplifer.
An ampifer in the first stage, normally can get better noise figure, but it will degrade the high power performance, we have to compromise between high and low power.

Lin

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
>
> Hi Lin and others,
>
> Two questions come to mind.
>
> First, my cavity filter (I've only constructed one) has 7-8dB of loss.
> What is the trick to decreasing the loss from 7-8dB to the 4dB range?
>
> Secondly, intuitively I understand that we'd like as low a loss as
> possible in the cavity filter. How would a less lossy cavity filter
> benefit or improve operation and use of the spectrum analyzer?
>
> Thanks.
>
> Steve K8JQ
>
> On 12/16/2011 12:02 PM, inlinebeginner wrote:
> > Today I measured with HP VAN, the insertion loss I got is 4.3dB. Looks like my MSA did not calibrate well above 1GHz in 1G band.
> > Anyway, 4.3dB is still better than 7.1dB, which is what I got on my firts cavity filter.
> > The interesting thing I experenced is that I disassembled this cavity filter after I first time assembled it completely. Because I saw a 20dB insertion loss. I removed the top and bottom end plates and checked hairpins, and found the center one was short to ground,

due to the wrong material I used for spacers, they are melt at high temperature. I changed tje spacers and put the top and bottom end plates back, it works very well.
> > Lin
> > --- In spectrumanalyzer@yahoogroups.com, "Sam"<swetterlin@> wrote:
> >> Lin,
> >> Very nice. That's about as good as it gets.
> >> Sam W.
> >>
> >> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner"<inlinebeginner@> wrote:
> >>> I just build my 2nd cavity filter, the insertion loss: 3.98dB. It is much better than my 1st one built about 1.5 years ago.
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> >>> Photo is here:
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8973. Re: [spectrumanalyzer] Re: My 2nd cavity filter performance, 3.98dB insertion loss

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 18:21:07 UTC
From: w4zcb
Topic: 8964 Message: 8973

Overcouple it! 7-8 dB is normal, 4 isn't necessarily better. Usually leads to wider skirts.

W4ZCB

> Hi Lin and others,
>
> Two questions come to mind.
>
> First, my cavity filter (I've only constructed one) has 7-8dB of
> loss.
> What is the trick to decreasing the loss from 7-8dB to the 4dB
> range?
>
> Secondly, intuitively I understand that we'd like as low a loss as
> possible in the cavity filter. How would a less lossy cavity filter
> benefit or improve operation and use of the spectrum analyzer?
>
> Thanks.
>
> Steve K8JQ
>
> On 12/16/2011 12:02 PM, inlinebeginner wrote:
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>> Looks like my MSA did not calibrate well above 1GHz in 1G band.
>> Anyway, 4.3dB is still better than 7.1dB, which is what I got on my
>> firts cavity filter.
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>> cavity filter after I first time assembled it completely. Because I
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>> and checked hairpins, and found the center one was short to ground,
>> due to the wrong material I used for spacers, they are melt at high
>> temperature. I changed tje spacers and put the top and bottom end
>> plates back, it works very well.
>> Lin
>> --- In spectrumanalyzer@yahoogroups.com, "Sam"<swetterlin@...>
>> wrote:
>>> Lin,
>>> Very nice. That's about as good as it gets.
>>> Sam W.
>>>
>>> --- In spectrumanalyzer@yahoogroups.com,
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8974. Re: [spectrumanalyzer] Re: My 2nd cavity filter performance, 3.98dB insertion loss

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 18:30:28 UTC
From: william sprowls
Topic: 8964 Message: 8974

Hi Steve,
Realy good question. With a well tuned filter, and not just a cavity filter, we would like the filter to be "critically coupled". That means minimal insertion loss and minimimum (designed) bandwidth and linear group delay. You can have all three, but it is very hard to achieve, especially on the home bench. We usually wind up with either of these two:
Overcoupling, which produces a wider bandwidth and less loss and crazy group delay (phase).
Undercoupling, which produces higher loss without narrowing the bandwidwidth much less than what you would get with critical coupling. Group delay suffers but not as much as when overcoupled.
If I can't get perfection, I always settle for a little undercoupling. This actually makes the filter a little easier to tune, as the elements don't interact as much as overcoupling. A little more loss is not a big deal in the MSA, where it might be in low noise reciever systems.
The hairpins are what determine the amount of coupling. Hairpins closer to the wall produces less coupled energy (undercoupling). Hairpins further from the wall produces more coupled energy (overcoupling).
You can play with the hairpins from the tops of each cavity (no top cover) until a happy medium is reached. Do this at a higher frequency. When happy with the hairpins, add the top and tune for your nominal center frequency (1013).
Our critically coupled 4 cavity filter should have 3.1 dB of insertion loss. I have been able to tune a single cavity to critical with .78 dB of loss and a bandwidth of 6.3 MHz. I have never gotten better than 4.2 dB loss with all four.
Scotty

--- On Fri, 12/16/11, Steve <steve65@...> wrote:

From: Steve <steve65@...>
Subject: Re: [spectrumanalyzer] Re: My 2nd cavity filter performance, 3.98dB insertion loss
To: spectrumanalyzer@yahoogroups.com
Date: Friday, December 16, 2011, 11:14 AM

Hi Lin and others,

Two questions come to mind.

First, my cavity filter (I've only constructed one) has 7-8dB of loss.

What is the trick to decreasing the loss from 7-8dB to the 4dB range?

Secondly, intuitively I understand that we'd like as low a loss as

possible in the cavity filter. How would a less lossy cavity filter

benefit or improve operation and use of the spectrum analyzer?

Thanks.

Steve K8JQ

On 12/16/2011 12:02 PM, inlinebeginner wrote:

> Today I measured with HP VAN, the insertion loss I got is 4.3dB. Looks like my MSA did not calibrate well above 1GHz in 1G band.

> Anyway, 4.3dB is still better than 7.1dB, which is what I got on my firts cavity filter.

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> Lin

> --- In spectrumanalyzer@yahoogroups.com, "Sam"<swetterlin@...> wrote:

>> Lin,

>> Very nice. That's about as good as it gets.

>> Sam W.

>>

>> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner"<inlinebeginner@> wrote:

>>> I just build my 2nd cavity filter, the insertion loss: 3.98dB. It is much better than my 1st one built about 1.5 years ago.

>>> The test result is here:

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>>> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/387914832/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc

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>>> The over all rejection is here:

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>>> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1777865914/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc

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>>> Photo is here:

>>> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/608225844/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc

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>>> Lin

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8975. translation of the MSA's web site

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 18:42:53 UTC
From: marc olanié
Topic: 8975 Message: 8975

Hi Scotty

Just a line dropped to inform you that all the descriptions, building instructions and test procedure for the MSA have been translated into French.

This translation has been made by the Electrolab Team, in Nanterre (close to Paris city), with the help of a small ham radio guys. Too much hams and “hardware hackers” where interested building the MSA but were afraid to be lost with a foreign language.

http://wiki.electrolab.fr/Projets:Lab:2011:SA-Scotty

It was quite a challenge. All the work has been done in approximately 1 week

We can send you the whole contend if you need it (it’s a simple Wiki structure), for you or for Canadian MSA addicts wishing to have it.

Hope it will help to spread the “MSA Jihad” all around the world :- D

Cheers

Marc

8976. Re: My 2nd cavity filter performance, 3.98dB insertion loss

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 19:11:37 UTC
From: inlinebeginner
Topic: 8964 Message: 8976

W4ZCB
Overcoupled? Very less likely. I measured the rejection 107.2dB at 1034MHz image frequency. This shows the skirt is steepper than 1st cavity filter.
I use HP8648 provide +20dBm tone at 1034MHz, and measure the output of the cavity filter with HP8560E, RBW 10Hz, and read MKA number -91.5dBm. Therefore, the rejection at 1034MHz is +20 - (-91.5) -4.3 =107.2 dB. which is better than my 1st cavity filter 105dB rejection at 1034 MHz.
Lin

--- In spectrumanalyzer@yahoogroups.com, "w4zcb" <w4zcb@...> wrote:
>
> Overcouple it! 7-8 dB is normal, 4 isn't necessarily better. Usually
> leads to wider skirts.
>
> W4ZCB
>
> > Hi Lin and others,
> >
> > Two questions come to mind.
> >
> > First, my cavity filter (I've only constructed one) has 7-8dB of
> > loss.
> > What is the trick to decreasing the loss from 7-8dB to the 4dB
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> > Thanks.
> >
> > Steve K8JQ
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> >> --- In spectrumanalyzer@yahoogroups.com, "Sam"<swetterlin@>
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> >>> Very nice. That's about as good as it gets.
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> >>>
> >>> --- In spectrumanalyzer@yahoogroups.com,
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> >>>> I just build my 2nd cavity filter, the insertion loss: 3.98dB. It
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> >>>> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/177786591
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8977. Re: [spectrumanalyzer] translation of the MSA's web site

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 19:18:39 UTC
From: william sprowls
Topic: 8975 Message: 8977

Wouldn't it be great if our Congressmen could translate and communicate that efficiently?
Scotty

--- On Fri, 12/16/11, marc olanié <Marc.olanie@decision.fr> wrote:

From: marc olanié <Marc.olanie@...>
Subject: [spectrumanalyzer] translation of the MSA's web site
To: spectrumanalyzer@yahoogroups.com
Date: Friday, December 16, 2011, 12:42 PM

Hi ScottyJust a line dropped to inform you that all the descriptions, building instructions and test procedure for the MSA have been translated into French. This translation has been made by the Electrolab Team, in Nanterre (close to Paris city), with the help of a small ham radio guys. Too much hams and “hardware hackers” where interested building the MSA but were afraid to be lost with a foreign language.
http://wiki.electrolab.fr/Projets:Lab:2011:SA-Scotty It was quite a challenge. All the work has been done in approximately 1 week We can send you the whole contend if you need it (it’s a simple Wiki structure), for you or for Canadian MSA addicts wishing to have it.
Hope it will help to spread the “MSA Jihad” all around the world :- D Cheers Marc

8978. Re: Noise Experiment

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 19:32:46 UTC
From: Sam
Topic: 8913 Message: 8978

Yes, with the switched noise filter of about 60 kHz on the narrowest two RBW, and 500 kHz on the wide ones.

One further result: I took the attenuator off the amp so I had gain of 30 dB and went through the calibration procedure (without actually changing my cal file) so I could click Measure and get the average of many measurements. I wanted to see how low I could go before two adjacent signal levels gave pretty much the same ADC readings. The readings vary a bit due to noise, so you have to do 3 or 4 Measures and average the results. I could distinguish between -142 dBm and -143 dBm, though the difference was small and not of much practical use. I didn't try any lower. This is about as far as one could expect to go with a 600 Hz RBW.

I could just leave the 30 dB amp in place and use an attenuator when I want to look at high level signals (an attenuator is nice anyway due to its improvement of input return loss and some other good effects.) Alternatively, I could use an external amp when looking at low level signals, but it is a much simpler matter to add and remove an attenuator than to do the same with an amp.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> Are you using expended log detector during your test?
> Thanks
> Lin
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Further results with my 10 dB amp in front of the cavity filter. Minimum visible signal levels (XNarrow video filter) with different RBW:
> >
> > 600 Hz -124 dBm
> > 8 kHz -118 dBm
> > 30 kHz -114 dBm
> > 400 kHz -105 dBm
> >
> > My standard for "visible" is that the signal is obvious and steady enough that you would be confident there is a signal there, even if you didn't know about the signal in advance. There is a bit of subjectivity in the test. I was being conservative, looking for very obvious signals, and could legitimately claim that the numbers are 1 or 2 dB better than shown above.
> >
> > I am especially happy to be getting such good results at the wide bandwidths, which means I can see weak signals even when scanning broad frequency ranges.
> >
> > Sam W.

> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > Scotty,
> > > I just picked up on your message. My amp seemed to function fine, and I think it handles fairly high power. I definitely got more output as I increased the input level. It's crazy to use a 30 dB amp and attenuate it down to 10 dB, but that is the only canned low noise amp I have. If I permanently implement this, I will use an amp with lower gain.
> > >
> > > Also, some additional info. When I did the amp test, the signals seemed surprisingly noisy even with a heavy video filter. I thought maybe I was mis-remembering what the low level noise should look like, so I went ahead with the test. Today I realized that the video filter was not being automatically set, because in a software experiment a while ago I reconfigured and told the software I did not have the automatic video filter. So I configured correctly and the noise went away. I can't tell you how much time I wasted diagnosing this (suspecting Latch 4, etc.) before I realized it was a configuration problem.
> > >
> > > With the greatly reduced noise and a 600 Hz RBW, my minimum visible signal was -115 dBm before adding the amp, and -124 dBm with the amp. And I wasn't stretching it--the -124 dBm signal was perfectly obvious on every scan when using the XNarrow filter. It came and went when using the Narrow filter.
> > >
> > > Lin, on the question of whether the mixers operate at low level, this shows that the ADE in Mixer 1 operates at least as low as -127 dBm (-124 dBm input minus the 3 dB pad) and that Mixer 2 operates at least as low as -142 dBm. Reaching -124 dBm at the MSA input with a 600 Hz RBW is darn good when you compare it to an HP reaching -140 dBm with 1 Hz RBW.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > > >
> > > > With an amplifier on the output of Mixer 1, consider this. Because of "fair" mixer isolation the L port power will be about 35 dB down at the R port. +7-35=-28 dBm. With a 30 dB amplifier, this is a honking +2 dBm out of the amplifier. Not knowing your flavor of amplifier, is it in saturation?
> > > > Scotty
> > > >
> > > > --- On Tue, 12/13/11, Sam <swetterlin@> wrote:
> > > >
> > > > From: Sam <swetterlin@>
> > > > Subject: [spectrumanalyzer] Noise Experiment
> > > > To: spectrumanalyzer@yahoogroups.com
> > > > Date: Tuesday, December 13, 2011, 1:05 PM
> >
> > > >
> > > > As Harold said, one experiment is worth a thousand expert opinions, so I did an experiment with an amplifier in front of my cavity filter. Just an amp, no SAW or other additional filter.
> > > >

> > > > I used a 30 dB amp with 20 dB pad on the output, for a net of 10 dB gain. The amp spec says it has NF=2.3 dB. I inserted it between my diplexer output and the cavity input. I did not recalibrate, so the display levels became meaningless, so I just looked for the "minimum visible signal", which by my definition is the minimum signal that is recognizable as a distinct signal on every scan, even though its shape keeps changing due to noise. That signal previously was about -110 dBm, so I tried a level of -120 dBm. Lo and behold, there was the signal, visible on every scan, though sometimes choppy. (Note: the minimum visible signal seems to come out about 5-8 dB above the level that shows a consistent response during calibration. You can also "cheat" by zooming in to make the signal wide, which makes it more visible. When comparing with and without amp, you just have to apply the same standards both times.)
> > > >
> > > > As to the high end: (I use the expanded log detector and an IF2 amp with gain of 28 dB, so others might get different results.) Up to about -10 dBm the response was very linear and then started to taper off. The change in response was still good at -5 dBm, and easily detectable but weak at 0 dBm.
> > > >
> > > > Next step is to reduce the IF2 amp gain by a couple dB to make the response at 0 dBm a bit more solid. We'll see if that increases the minimum visible signal.
> > > >
> > > > One downside of the amp is the possibility of IMD. But I suspect Mixer 1 is more of an IMD problem than the amp is. Still, to reduce the IMD possibilities (and maybe some spurs) I think I would at least put a low pass filter on the amp input to reduce signals at >1.5 GHz, because the LO1 harmonics are so strong. Of course, you could use a SAW as the filter, with better filtering but more loss.
> > > >
> > > > In short, this works quite well.
> > > >
> > > > P.S. the above was done with RBW=600 Hz. I increased the amp to 15 dB and wasn't sure whether or not there was an improvement. Reduced it to 6 dB and things got slightly worse. I then tried it with RBW=8 kHz with the 10 dB amp and got slightly better results than at 600 Hz. How well the amp works depends in part on where the noise bottleneck is in your MSA. A certain amount of narrow band noise reaches the log detector and the log detector adds a lot of wide band noise. Once you reduce the narrow band noise enough so the wide band noise dominates, further reductions accomplish nothing.
> > > >
> > > > Sam W.
> >
>

8979. Re: My 2nd cavity filter performance, 3.98dB insertion loss

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 19:46:43 UTC
From: Sam
Topic: 8964 Message: 8979

You can get a good visual idea of the effect of over and under coupling by looking at what happens if you start with low coupling and gradually increase it. With low coupling you get a nice profile with narrow bandwidth, but large loss, so the profile appears low on the screen. As you increase the coupling, the profile slides upward with virtually no change in shape. At some point it hits a soft ceiling where the peak continues to move up only a tiny bit when the rest of the profile slides up, so it starts to flatten. As you increase the coupling, the top gets smushed on the ceiling and the 3 dB bandwidth starts to widen; you are now definitely over-coupled. At this point, since the bottom of the profile keeps sliding up but the top does not, the bandwidth at any given level--say -90 dBc--gets wider and wider.

I don't know the mathematical definition of critical coupling, but I view it as the point where the peak has flattened just a bit, because until the peak starts to flatten you have nothing to lose by increasing the coupling. If you want a very flat top, you can increase the coupling a little bit beyond that.

My guess is that Lin's cavity filter is slightly beyond critical coupling (hence nice and flat and with the minimum possible loss) but not enough to cause any problems, since the rejection at +21.4 MHz is still excellent.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Steve,
> Realy good question. With a well tuned filter, and not just a cavity filter, we would like the filter to be "critically coupled". That means minimal insertion loss and minimimum (designed) bandwidth and linear group delay. You can have all three, but it is very hard to achieve, especially on the home bench. We usually wind up with either of these two:
> Overcoupling, which produces a wider bandwidth and less loss and crazy group delay (phase).
> Undercoupling, which produces higher loss without narrowing the bandwidwidth much less than what you would get with critical coupling. Group delay suffers but not as much as when overcoupled.
> Â If I can't get perfection, I always settle for a little undercoupling. This actually makes the filter a little easier to tune, as the elements don't interact as much as overcoupling. A little more loss is not a big deal in the MSA, where it might be in low noise reciever systems.
> Â The hairpins are what determine the amount of coupling. Hairpins closer to the wall produces less coupled energy (undercoupling). Hairpins further from the wall produces more coupled energy (overcoupling).
> Â You can play with the hairpins from the tops of each cavity (no top cover) until a happy medium is reached. Do this at a higher frequency. When happy with the hairpins, add the top and tune for your nominal center frequency (1013).
> Â Our critically coupled 4 cavity filter should have 3.1 dB of insertion loss. I have been able to tune a single cavity to critical with .78 dB of loss and a bandwidth of 6.3

MHz. I have never gotten better than 4.2 dB loss with all four.
> Scotty
> Â
>
> --- On Fri, 12/16/11, Steve <steve65@...> wrote:
>
> From: Steve <steve65@...>
> Subject: Re: [spectrumanalyzer] Re: My 2nd cavity filter performance, 3.98dB insertion loss
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, December 16, 2011, 11:14 AM
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> Hi Lin and others,
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> Two questions come to mind.
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> First, my cavity filter (I've only constructed one) has 7-8dB of loss.
>
> What is the trick to decreasing the loss from 7-8dB to the 4dB range?
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>

> Secondly, intuitively I understand that we'd like as low a loss as
>
> possible in the cavity filter. How would a less lossy cavity filter
>
> benefit or improve operation and use of the spectrum analyzer?
>
>
>
> Thanks.
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>
> Steve K8JQ
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>
> On 12/16/2011 12:02 PM, inlinebeginner wrote:
>
> > Today I measured with HP VAN, the insertion loss I got is 4.3dB. Looks like my MSA did not calibrate well above 1GHz in 1G band.
>
> > Anyway, 4.3dB is still better than 7.1dB, which is what I got on my firts cavity filter.
>
> > The interesting thing I experenced is that I disassembled this cavity filter after I first time assembled it completely. Because I saw a 20dB insertion loss. I removed the top and bottom end plates and checked hairpins, and found the center one was short to ground, due to the wrong material I used for spacers, they are melt at high temperature. I changed tje spacers and put the top and bottom end plates back, it works very well.
>
> > Lin
>
> > --- In spectrumanalyzer@yahoogroups.com, "Sam"<swetterlin@> wrote:
>
> >> Lin,
>
> >> Very nice. That's about as good as it gets.
>
> >> Sam W.
>
> >>
>
> >> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner"<inlinebeginner@> wrote:
>
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>
> >>> The test result is here:
>
> >>>

>
> >>> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/387914832/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
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> >>>
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> >>> The over all rejection is here:
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> >>>
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> >>> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1777865914/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
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> >>> Photo is here:
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> >>> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/608225844/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
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> >>> Lin
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8980. Re: [spectrumanalyzer] Re: My 2nd cavity filter performance, 3.98dB insertion loss

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 19:51:43 UTC
From: w4zcb
Topic: 8964 Message: 8980

Congratulations

W4ZCB

W4ZCB
Overcoupled? Very less likely. I measured the rejection 107.2dB at
1034MHz image frequency. This shows the skirt is steepper than 1st
cavity filter.
I use HP8648 provide +20dBm tone at 1034MHz, and measure the output
of the cavity filter with HP8560E, RBW 10Hz, and read MKA
number -91.5dBm. Therefore, the rejection at 1034MHz is +20 -
(-91.5) -4.3 =107.2 dB. which is better than my 1st cavity filter
105dB rejection at 1034 MHz.
Lin

--- In spectrumanalyzer@yahoogroups.com, "w4zcb" <w4zcb@...> wrote:
>
> Overcouple it! 7-8 dB is normal, 4 isn't necessarily better.
> Usually
> leads to wider skirts.
>
> W4ZCB
>
> > Hi Lin and others,
> >
> > Two questions come to mind.
> >
> > First, my cavity filter (I've only constructed one) has 7-8dB of
> > loss.
> > What is the trick to decreasing the loss from 7-8dB to the 4dB
> > range?
> >
> > Secondly, intuitively I understand that we'd like as low a loss as
> > possible in the cavity filter. How would a less lossy cavity
> > filter
> > benefit or improve operation and use of the spectrum analyzer?
> >
> > Thanks.
> >
> > Steve K8JQ
> >
> > On 12/16/2011 12:02 PM, inlinebeginner wrote:
> >> Today I measured with HP VAN, the insertion loss I got is 4.3dB.
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> >> and checked hairpins, and found the center one was short to
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> >> temperature. I changed tje spacers and put the top and bottom end
> >> plates back, it works very well.
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> >> --- In spectrumanalyzer@yahoogroups.com, "Sam"<swetterlin@>
> >> wrote:
> >>> Lin,
> >>> Very nice. That's about as good as it gets.
> >>> Sam W.
> >>>
> >>> --- In spectrumanalyzer@yahoogroups.com,
> >>> "inlinebeginner"<inlinebeginner@> wrote:
> >>>> I just build my 2nd cavity filter, the insertion loss: 3.98dB.
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> >>>> is much better than my 1st one built about 1.5 years ago.
> >>>> The test result is here:
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/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
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> >>>> Photo is here:
> >>>> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/608225844
/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
> >>>>
> >>>> Lin
> >>>>
> >>
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8981. Re: My 2nd cavity filter performance, 3.98dB insertion loss

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 20:15:29 UTC
From: Sam
Topic: 8964 Message: 8981

Lin,
Regarding your comment on calibration. If you are trying to distinguish between 4.0 and 4.3 dB, it is absolutely critical to have an attenuator on the MSA input to make the input return loss as high as possible. This is especially true if the signal source may be very reflective. Otherwise, reflections between the MSA and the signal source can affect the measurement. (Alternatively, you could view the attenuator as part of the cavity, improving its output return loss.)

Likewise, when you do the initial calibration, your signal source must have high return loss or you must use a good attenuator.

In addition to the issue of reflections at the signal frequency, there are high frequency components that leak out the MSA input and may or may not get reflected back in, and an attenuator deals with these. I have pointed out in the past that if I measure a signal from a 50 ohm signal generator with and without a 1 GHz low pass filter, I get a 0.5 dB higher signal level with the filter, suggesting that the filter has negative insertion loss (i.e. gain). That is due to the LPF reflecting the high frequency components (mostly LO1) back in to the MSA.

It is quite easy to have a signal source that has reasonable return loss at the signal frequency, but bad return loss above 1 or 2 GHz, so the high frequency effect can catch you by surprise.

You can drive yourself crazy trying to resolve discrepancies of 0.3 dB, but a good attenuator on the MSA input can eliminate some such problems. Many commercial attenuators I have tested are not that great with regard to return loss--e.g. their DC input resistance when properly terminated might be 47 ohms. So you have to make your own or test the commercial ones. Of course, you can use the MSA to do the test.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Today I measured with HP VAN, the insertion loss I got is 4.3dB. Looks like my MSA did not calibrate well above 1GHz in 1G band.
> Anyway, 4.3dB is still better than 7.1dB, which is what I got on my firts cavity filter.
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> > >
> > > Lin
> > >
> >
>

8982. Re: [spectrumanalyzer] translation of the MSA's web site

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 20:17:05 UTC
From: Christian Cziezerski
Topic: 8975 Message: 8982

Marc,

I took a look and I'm impressed. Would you mind if I shared the link at our university? We have a number of French Electronics students who might be interested.

Chris

On Fri, Dec 16, 2011 at 9:18 PM, william sprowls <wsprowls@...> wrote:

> **
>
>
> Wouldn't it be great if our Congressmen could translate and communicate
> that efficiently?
> Scotty
>
> --- On *Fri, 12/16/11, marc olanié <Marc.olanie@...>* wrote:
>
>
> From: marc olanié <Marc.olanie@...>
> Subject: [spectrumanalyzer] translation of the MSA's web site
> To: spectrumanalyzer@yahoogroups.com
> Date: Friday, December 16, 2011, 12:42 PM
>
>
>
>
> Hi Scotty
>
> Just a line dropped to inform you that all the descriptions, building
> instructions and test procedure for the MSA have been translated into
> French.
>
> This translation has been made by the Electrolab Team, in Nanterre (close
> to Paris city), with the help of a small ham radio guys. Too much hams and
> “hardware hackers” where interested building the MSA but were afraid to be
> lost with a foreign language.
>
>
>
> http://wiki.electrolab.fr/Projets:Lab:2011:SA-Scotty
>
>
>
> It was quite a challenge. All the work has been done in approximately 1

> week
>
>
>
> We can send you the whole contend if you need it (it’s a simple Wiki
> structure), for you or for Canadian MSA addicts wishing to have it.
>
>
>
> Hope it will help to spread the “MSA Jihad” all around the world :- D
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> Cheers
>
> Marc
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8983. Re: Noise Experiment

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 20:54:53 UTC
From: inlinebeginner
Topic: 8913 Message: 8983

Sam
If you can put a programable attenuator there, it would be a useful way to switch the range and sensitivity of your MSA.
Lin
--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Yes, with the switched noise filter of about 60 kHz on the narrowest two RBW, and 500 kHz on the wide ones.
>
> One further result: I took the attenuator off the amp so I had gain of 30 dB and went through the calibration procedure (without actually changing my cal file) so I could click Measure and get the average of many measurements. I wanted to see how low I could go before two adjacent signal levels gave pretty much the same ADC readings. The readings vary a bit due to noise, so you have to do 3 or 4 Measures and average the results. I could distinguish between -142 dBm and -143 dBm, though the difference was small and not of much practical use. I didn't try any lower. This is about as far as one could expect to go with a 600 Hz RBW.
>
> I could just leave the 30 dB amp in place and use an attenuator when I want to look at high level signals (an attenuator is nice anyway due to its improvement of input return loss and some other good effects.) Alternatively, I could use an external amp when looking at low level signals, but it is a much simpler matter to add and remove an attenuator than to do the same with an amp.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
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> > Sam
> > Are you using expended log detector during your test?
> > Thanks
> > Lin
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > > Further results with my 10 dB amp in front of the cavity filter. Minimum visible signal levels (XNarrow video filter) with different RBW:
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> > > 600 Hz -124 dBm
> > > 8 kHz -118 dBm
> > > 30 kHz -114 dBm
> > > 400 kHz -105 dBm
> > >
> > > My standard for "visible" is that the signal is obvious and steady enough that you would be confident there is a signal there, even if you didn't know about the signal in advance. There is a bit of subjectivity in the test. I was being conservative, looking for

very obvious signals, and could legitimately claim that the numbers are 1 or 2 dB better than shown above.
> > >
> > > I am especially happy to be getting such good results at the wide bandwidths, which means I can see weak signals even when scanning broad frequency ranges.
> > >
> > > Sam W.
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> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > > > Scotty,
> > > > I just picked up on your message. My amp seemed to function fine, and I think it handles fairly high power. I definitely got more output as I increased the input level. It's crazy to use a 30 dB amp and attenuate it down to 10 dB, but that is the only canned low noise amp I have. If I permanently implement this, I will use an amp with lower gain.
> > > >
> > > > Also, some additional info. When I did the amp test, the signals seemed surprisingly noisy even with a heavy video filter. I thought maybe I was mis-remembering what the low level noise should look like, so I went ahead with the test. Today I realized that the video filter was not being automatically set, because in a software experiment a while ago I reconfigured and told the software I did not have the automatic video filter. So I configured correctly and the noise went away. I can't tell you how much time I wasted diagnosing this (suspecting Latch 4, etc.) before I realized it was a configuration problem.
> > > >
> > > > With the greatly reduced noise and a 600 Hz RBW, my minimum visible signal was -115 dBm before adding the amp, and -124 dBm with the amp. And I wasn't stretching it--the -124 dBm signal was perfectly obvious on every scan when using the XNarrow filter. It came and went when using the Narrow filter.
> > > >
> > > > Lin, on the question of whether the mixers operate at low level, this shows that the ADE in Mixer 1 operates at least as low as -127 dBm (-124 dBm input minus the 3 dB pad) and that Mixer 2 operates at least as low as -142 dBm. Reaching -124 dBm at the MSA input with a 600 Hz RBW is darn good when you compare it to an HP reaching -140 dBm with 1 Hz RBW.
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> > > > Sam W.
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> > > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
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> > > > > With an amplifier on the output of Mixer 1, consider this. Because of "fair" mixer isolation the L port power will be about 35 dB down at the R port. +7-35=-28 dBm. With a 30 dB amplifier, this is a honking +2 dBm out of the amplifier. Not knowing your flavor of amplifier, is it in saturation?
> > > > > Scotty
> > > > >
> > > > > --- On Tue, 12/13/11, Sam <swetterlin@> wrote:
> > > > >
> > > > > From: Sam <swetterlin@>
> > > > > Subject: [spectrumanalyzer] Noise Experiment
> > > > > To: spectrumanalyzer@yahoogroups.com

> > > > > Date: Tuesday, December 13, 2011, 1:05 PM
> > >
> > > > >
> > > > > As Harold said, one experiment is worth a thousand expert opinions, so I did an experiment with an amplifier in front of my cavity filter. Just an amp, no SAW or other additional filter.
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> > > > > I used a 30 dB amp with 20 dB pad on the output, for a net of 10 dB gain. The amp spec says it has NF=2.3 dB. I inserted it between my diplexer output and the cavity input. I did not recalibrate, so the display levels became meaningless, so I just looked for the "minimum visible signal", which by my definition is the minimum signal that is recognizable as a distinct signal on every scan, even though its shape keeps changing due to noise. That signal previously was about -110 dBm, so I tried a level of -120 dBm. Lo and behold, there was the signal, visible on every scan, though sometimes choppy. (Note: the minimum visible signal seems to come out about 5-8 dB above the level that shows a consistent response during calibration. You can also "cheat" by zooming in to make the signal wide, which makes it more visible. When comparing with and without amp, you just have to apply the same standards both times.)
> > > > >
> > > > > As to the high end: (I use the expanded log detector and an IF2 amp with gain of 28 dB, so others might get different results.) Up to about -10 dBm the response was very linear and then started to taper off. The change in response was still good at -5 dBm, and easily detectable but weak at 0 dBm.
> > > > >
> > > > > Next step is to reduce the IF2 amp gain by a couple dB to make the response at 0 dBm a bit more solid. We'll see if that increases the minimum visible signal.
> > > > >
> > > > > One downside of the amp is the possibility of IMD. But I suspect Mixer 1 is more of an IMD problem than the amp is. Still, to reduce the IMD possibilities (and maybe some spurs) I think I would at least put a low pass filter on the amp input to reduce signals at >1.5 GHz, because the LO1 harmonics are so strong. Of course, you could use a SAW as the filter, with better filtering but more loss.
> > > > >
> > > > > In short, this works quite well.
> > > > >
> > > > > P.S. the above was done with RBW=600 Hz. I increased the amp to 15 dB and wasn't sure whether or not there was an improvement. Reduced it to 6 dB and things got slightly worse. I then tried it with RBW=8 kHz with the 10 dB amp and got slightly better results than at 600 Hz. How well the amp works depends in part on where the noise bottleneck is in your MSA. A certain amount of narrow band noise reaches the log detector and the log detector adds a lot of wide band noise. Once you reduce the narrow band noise enough so the wide band noise dominates, further reductions accomplish nothing.
> > > > >
> > > > > Sam W.
> > >
> >
>

8984. Re: Noise Experiment

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 21:14:50 UTC
From: inlinebeginner
Topic: 8913 Message: 8984

Here is a programmable attenuator:
http://www.triquint.com/prodserv/more_info/proddisp.aspx?prod_id=TQP4M9072

DC - 4 GHz
0.5 dB LSB Steps to 31.5dB
+57 dBm Input IP3
1.6 dB Insertion Loss @ 2 GHz
TTL / CMOS Compatible Serial Control Interface
No requirement for external bypass capacitors for operation above 700 MHz
50 O Impedance
+5V Supply Voltage
4x4mm QFN package

After we add this attenuator, we may need to design an auto calibration routine. Because the cases will be increased rapidly, considering all the RBW combinations.

Lin

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> If you can put a programable attenuator there, it would be a useful way to switch the range and sensitivity of your MSA.
> Lin
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Yes, with the switched noise filter of about 60 kHz on the narrowest two RBW, and 500 kHz on the wide ones.
> >
> > One further result: I took the attenuator off the amp so I had gain of 30 dB and went through the calibration procedure (without actually changing my cal file) so I could click Measure and get the average of many measurements. I wanted to see how low I could go before two adjacent signal levels gave pretty much the same ADC readings. The readings vary a bit due to noise, so you have to do 3 or 4 Measures and average the results. I could distinguish between -142 dBm and -143 dBm, though the difference was small and not of much practical use. I didn't try any lower. This is about as far as one could expect to go with a 600 Hz RBW.
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> > I could just leave the 30 dB amp in place and use an attenuator when I want to look at high level signals (an attenuator is nice anyway due to its improvement of input return loss and some other good effects.) Alternatively, I could use an external amp when looking at low level signals, but it is a much simpler matter to add and remove an attenuator than to do the same with an amp.
> >
> > Sam W.
> >

> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > >
> > > Sam
> > > Are you using expended log detector during your test?
> > > Thanks
> > > Lin
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >
> > > > Further results with my 10 dB amp in front of the cavity filter. Minimum visible signal levels (XNarrow video filter) with different RBW:
> > > >
> > > > 600 Hz -124 dBm
> > > > 8 kHz -118 dBm
> > > > 30 kHz -114 dBm
> > > > 400 kHz -105 dBm
> > > >
> > > > My standard for "visible" is that the signal is obvious and steady enough that you would be confident there is a signal there, even if you didn't know about the signal in advance. There is a bit of subjectivity in the test. I was being conservative, looking for very obvious signals, and could legitimately claim that the numbers are 1 or 2 dB better than shown above.
> > > >
> > > > I am especially happy to be getting such good results at the wide bandwidths, which means I can see weak signals even when scanning broad frequency ranges.
> > > >
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > >
> > > > > Scotty,
> > > > > I just picked up on your message. My amp seemed to function fine, and I think it handles fairly high power. I definitely got more output as I increased the input level. It's crazy to use a 30 dB amp and attenuate it down to 10 dB, but that is the only canned low noise amp I have. If I permanently implement this, I will use an amp with lower gain.
> > > > >
> > > > > Also, some additional info. When I did the amp test, the signals seemed surprisingly noisy even with a heavy video filter. I thought maybe I was mis-remembering what the low level noise should look like, so I went ahead with the test. Today I realized that the video filter was not being automatically set, because in a software experiment a while ago I reconfigured and told the software I did not have the automatic video filter. So I configured correctly and the noise went away. I can't tell you how much time I wasted diagnosing this (suspecting Latch 4, etc.) before I realized it was a configuration problem.
> > > > >
> > > > > With the greatly reduced noise and a 600 Hz RBW, my minimum visible signal was -115 dBm before adding the amp, and -124 dBm with the amp. And I wasn't stretching it--the -124 dBm signal was perfectly obvious on every scan when using the XNarrow filter. It came and went when using the Narrow filter.
> > > > >
> > > > > Lin, on the question of whether the mixers operate at low level, this shows that

the ADE in Mixer 1 operates at least as low as -127 dBm (-124 dBm input minus the 3 dB pad) and that Mixer 2 operates at least as low as -142 dBm. Reaching -124 dBm at the MSA input with a 600 Hz RBW is darn good when you compare it to an HP reaching -140 dBm with 1 Hz RBW.
> > > > >
> > > > > Sam W.
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> > > > > --- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@> wrote:
> > > > > >
> > > > > > With an amplifier on the output of Mixer 1, consider this. Because of "fair" mixer isolation the L port power will be about 35 dB down at the R port. +7-35=-28 dBm. With a 30 dB amplifier, this is a honking +2 dBm out of the amplifier. Not knowing your flavor of amplifier, is it in saturation?
> > > > > > Scotty
> > > > > >
> > > > > > --- On Tue, 12/13/11, Sam <swetterlin@> wrote:
> > > > > >
> > > > > > From: Sam <swetterlin@>
> > > > > > Subject: [spectrumanalyzer] Noise Experiment
> > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > Date: Tuesday, December 13, 2011, 1:05 PM
> > > > >
> > > > > >
> > > > > > As Harold said, one experiment is worth a thousand expert opinions, so I did an experiment with an amplifier in front of my cavity filter. Just an amp, no SAW or other additional filter.
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> > > > > > I used a 30 dB amp with 20 dB pad on the output, for a net of 10 dB gain. The amp spec says it has NF=2.3 dB. I inserted it between my diplexer output and the cavity input. I did not recalibrate, so the display levels became meaningless, so I just looked for the "minimum visible signal", which by my definition is the minimum signal that is recognizable as a distinct signal on every scan, even though its shape keeps changing due to noise. That signal previously was about -110 dBm, so I tried a level of -120 dBm. Lo and behold, there was the signal, visible on every scan, though sometimes choppy. (Note: the minimum visible signal seems to come out about 5-8 dB above the level that shows a consistent response during calibration. You can also "cheat" by zooming in to make the signal wide, which makes it more visible. When comparing with and without amp, you just have to apply the same standards both times.)
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> > > > > > As to the high end: (I use the expanded log detector and an IF2 amp with gain of 28 dB, so others might get different results.) Up to about -10 dBm the response was very linear and then started to taper off. The change in response was still good at -5 dBm, and easily detectable but weak at 0 dBm.
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SAW as the filter, with better filtering but more loss.
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> > > > > > In short, this works quite well.
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> > > > > > P.S. the above was done with RBW=600 Hz. I increased the amp to 15 dB and wasn't sure whether or not there was an improvement. Reduced it to 6 dB and things got slightly worse. I then tried it with RBW=8 kHz with the 10 dB amp and got slightly better results than at 600 Hz. How well the amp works depends in part on where the noise bottleneck is in your MSA. A certain amount of narrow band noise reaches the log detector and the log detector adds a lot of wide band noise. Once you reduce the narrow band noise enough so the wide band noise dominates, further reductions accomplish nothing.
> > > > > >
> > > > > > Sam W.
> > > >
> > >
> >
>

8985. Re: [spectrumanalyzer] Need ADE-11X mixer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 21:38:57 UTC
From: Christian Cziezerski
Topic: 8767 Message: 8985

Did you find those mixers?
I can send you two.

Chris

On Fri, Dec 2, 2011 at 2:50 AM, Jurgen <khj221@...> wrote:

> **
>
>
> Hello,
>
> I am in need of two ADE-11X mixers.
> If any one has some left over parts I will be happy to buy them.
>
> Thanks, Jurgen
>
>
>

8986. Amp Group buy update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 22:31:53 UTC
From: s.staines@cranfield.ac.uk
Topic: 8986 Message: 8986

Group buy is jogging along, well passed the £50 point, so no delivery charge to me, therefore the buy will go ahead.

Send your request to this email g7wasgroupbuy @ gmail.com remove spaces around @
I would like the following info
1/ the number of lots of 10 you want. (Minimum order 10)
2/ which amp ERA or LEE, or the number of lots of each.
3/ your country of residence, so I can work out a list of postage costs.
Rough cost for 1 lot of 10 ERA amps inc package is going to be in the order of UK £17.65
Rough cost for 1 lot of 10 LEE amps inc package is going to be in the order of UK £12.10

Royal mail price finder Webb page still down.

If you have any comments/suggestion or can find a cheaper source please say. Is the minimum order of 10 Okay.
Steve g7was.

8987. Re: Noise Experiment

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 22:38:47 UTC
From: Sam
Topic: 8913 Message: 8987

Lin,
That's an impressive device. But for myself, I find it a simple matter to add/remove attenuators, and I don't have much use for attenuation in small steps, so it wouldn't be worth the trouble.

I did find an interesting technique in their data sheet. The evaluation board has SMA end-launch connectors, and the center pins have a 0.2 pF capacitors to ground "to resonate out the inductance of the connector." Interesting idea, though they use thin PCB where via inductance is small; a different value might be needed on 0.060" boards.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Here is a programmable attenuator:
> http://www.triquint.com/prodserv/more_info/proddisp.aspx?prod_id=TQP4M9072
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> DC - 4 GHz
> 0.5 dB LSB Steps to 31.5dB
> +57 dBm Input IP3
> 1.6 dB Insertion Loss @ 2 GHz
> TTL / CMOS Compatible Serial Control Interface
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> After we add this attenuator, we may need to design an auto calibration routine. Because the cases will be increased rapidly, considering all the RBW combinations.
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> Lin
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> > > Yes, with the switched noise filter of about 60 kHz on the narrowest two RBW, and 500 kHz on the wide ones.
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> > > One further result: I took the attenuator off the amp so I had gain of 30 dB and went through the calibration procedure (without actually changing my cal file) so I could click

Measure and get the average of many measurements. I wanted to see how low I could go before two adjacent signal levels gave pretty much the same ADC readings. The readings vary a bit due to noise, so you have to do 3 or 4 Measures and average the results. I could distinguish between -142 dBm and -143 dBm, though the difference was small and not of much practical use. I didn't try any lower. This is about as far as one could expect to go with a 600 Hz RBW.
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> > > > > > Also, some additional info. When I did the amp test, the signals seemed

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> > > > > > > Subject: [spectrumanalyzer] Noise Experiment
> > > > > > > To: spectrumanalyzer@yahoogroups.com
> > > > > > > Date: Tuesday, December 13, 2011, 1:05 PM
> > > > > >
> > > > > > > >
> > > > > > > As Harold said, one experiment is worth a thousand expert opinions, so I did an experiment with an amplifier in front of my cavity filter. Just an amp, no SAW or other additional filter.
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> > > > > > > I used a 30 dB amp with 20 dB pad on the output, for a net of 10 dB gain. The amp spec says it has NF=2.3 dB. I inserted it between my diplexer output and the cavity input. I did not recalibrate, so the display levels became meaningless, so I just looked for the "minimum visible signal", which by my definition is the minimum signal that is recognizable as a distinct signal on every scan, even though its shape keeps changing due to noise. That signal previously was about -110 dBm, so I tried a level of -120 dBm. Lo and behold, there was the signal, visible on every scan, though sometimes choppy. (Note: the minimum visible signal seems to come out about 5-8 dB above the level that shows a consistent response during calibration. You can also "cheat" by zooming in to make the signal wide, which makes it more visible. When comparing with and without amp, you just

have to apply the same standards both times.)
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> > > > > > >
> > > > > > > Sam W.
> > > > >
> > > >
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> >
>

8988. Re: Cavity filter test results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 22:45:26 UTC
From: neganur
Topic: 8694 Message: 8988

I meant to post my results earlier but got caught up in work.

My filter is finished and the results are:

Centre frequency: 1013.3 MHz

Insertion loss: -8.57 dB

Bandwidth(3 dB): 1.10 MHz
Bandwidth(6 dB): not tested
Bandwidth(30 dB): 3.25 MHz
Bandwidth(60 dB): 7.76 MHz

Rejection(1024 MHz): -104 dB
Rejection(1034.7 MHz): -114 dB

The entire filter is made of copper. I used 0.2" flat bar for the top an bottom plates.

The thick copper bars have almost been a show-stopper for me since it was impossible to drill holes for the hair pin couplers. Luckily, Sam recommended me to not drill holes at all and rather notch the tube and bend the hair pin through the notch. This worked very well.

I used a hot air gun to solder the tubes together and got very nice joints using this method. The tubes were then placed on top of the bottom plate. I placing a ring of solder wire on the inside of each cavity while and simply fed solder to the outside joints as the bottom plate was hot enough to melt it. Lots of flux and the result was excellent.

The annoying part began when I wanted to attach the top plate next evening. Since everything is made out of copper, the tubes were conducting the heat so well - the bottom joints were melting (meaning solder running down inside the cavities). I had to remove a lot of excess solder and redo the bottom joints once the metal cooled.

I also noticed that some of the holes that interconnect the cavities had lost solder and were not RF tight. How did other people solve this? I wonder if I should just leave a short piece of the 0.141" copper mantle on the hair pin instead of using just the Teflon.

Looking back, it was really much harder to gather all the material than the soldering. Hardware stores here suck.

All the drilling was done with a cheap hand drill. I hated every minute of it! Our workshop has a drill press, unfortunately I didn't get access to it.

There are a couple of pictures of the filter and transmission plots in my photo album:

http://groups.yahoo.com/group/spectrumanalyzer/photos/album/910808747/pic/list

Thanks again Sam, the hint regarding the couplers helped me to finish this!

Best regards
Chris

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> I build my cavity filter using a 1" copper tube on the outside. The rest
> is made of brass.
>
> Here are my cavity filter test results:
>
> Attenuation 5.8 dB
> Bandwidth 2.9 MHz at 6dB
> Center frequency 1013.3 MHz
>
> How does this compare to the rest of you.
>
> Thanks, Jurgen
>

8989. Re: [spectrumanalyzer] Re: Noise Experiment

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 23:44:37 UTC
From: Christian Cziezerski
Topic: 8913 Message: 8989

Lin,

I was looking at something similar with an Hittite HMC424LP3 (6-bit 0.5 dB LSB 31.5 dB DC-13 GHz)

http://www.hittite.com/content/documents/data_sheet/hmc424lp3.pdf

Your device has a better insertion loss, though.

Chris

On Sat, Dec 17, 2011 at 12:38 AM, Sam <swetterlin@...> wrote:

> **
>
>
> Lin,
> That's an impressive device. But for myself, I find it a simple matter to
> add/remove attenuators, and I don't have much use for attenuation in small
> steps, so it wouldn't be worth the trouble.
>
> I did find an interesting technique in their data sheet. The evaluation
> board has SMA end-launch connectors, and the center pins have a 0.2 pF
> capacitors to ground "to resonate out the inductance of the connector."
> Interesting idea, though they use thin PCB where via inductance is small; a
> different value might be needed on 0.060" boards.
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> > Here is a programmable attenuator:
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> >
> > DC - 4 GHz
> > 0.5 dB LSB Steps to 31.5dB
> > +57 dBm Input IP3
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> >
> > After we add this attenuator, we may need to design an auto calibration
> routine. Because the cases will be increased rapidly, considering all the
> RBW combinations.
> >
> > Lin
>

8990. Re: Cavity filter test results

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-16 23:55:53 UTC
From: Sam
Topic: 8694 Message: 8990

Nice, clean job of construction. When you soldered the top, it might have helped to wrap a wet rag around the bottom half to avoid melting the bottom (or maybe stand it in a pan of water). I would think you could apply some solder near any leaking holes and the solder would pool in that area. Maybe using low-temp solder might help for that limited purpose (Chip-Quik's "SMDLTFP"?)

Per the recent discussion of coupling, yours is likely a bit undercoupled, accounting for the slightly high insertion loss and very narrow bandwidth. But that's probably no big deal. In fact, following on my idea of using an amp in front of the cavity filter, I'm not sure the insertion loss of the filter has much significance at all. If your filter has somewhat high loss, just use a few more dB of amp gain.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "neganur" <neganur@...> wrote:
>
> I meant to post my results earlier but got caught up in work.
>
> My filter is finished and the results are:
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> Insertion loss: -8.57 dB
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>
> Rejection(1024 MHz): -104 dB
> Rejection(1034.7 MHz): -114 dB
>
> The entire filter is made of copper. I used 0.2" flat bar for the top an bottom plates.
>
> The thick copper bars have almost been a show-stopper for me since it was impossible to drill holes for the hair pin couplers. Luckily, Sam recommended me to not drill holes at all and rather notch the tube and bend the hair pin through the notch. This worked very well.
>
> I used a hot air gun to solder the tubes together and got very nice joints using this method. The tubes were then placed on top of the bottom plate. I placing a ring of solder wire on the inside of each cavity while and simply fed solder to the outside joints as the bottom plate was hot enough to melt it. Lots of flux and the result was excellent.
>
> The annoying part began when I wanted to attach the top plate next evening. Since everything is made out of copper, the tubes were conducting the heat so well - the bottom

joints were melting (meaning solder running down inside the cavities). I had to remove a lot of excess solder and redo the bottom joints once the metal cooled.
>
> I also noticed that some of the holes that interconnect the cavities had lost solder and were not RF tight. How did other people solve this? I wonder if I should just leave a short piece of the 0.141" copper mantle on the hair pin instead of using just the Teflon.
>
> Looking back, it was really much harder to gather all the material than the soldering. Hardware stores here suck.
>
> All the drilling was done with a cheap hand drill. I hated every minute of it! Our workshop has a drill press, unfortunately I didn't get access to it.
>
> There are a couple of pictures of the filter and transmission plots in my photo album:
>
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/910808747/pic/list
>
> Thanks again Sam, the hint regarding the couplers helped me to finish this!
>
>
> Best regards
> Chris
>
> --- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@> wrote:
> >
> > I build my cavity filter using a 1" copper tube on the outside. The rest
> > is made of brass.
> >
> > Here are my cavity filter test results:
> >
> > Attenuation 5.8 dB
> > Bandwidth 2.9 MHz at 6dB
> > Center frequency 1013.3 MHz
> >
> > How does this compare to the rest of you.
> >
> > Thanks, Jurgen
> >
>

8991. Enclosures

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-17 00:24:52 UTC
From: Sam
Topic: 3452 Message: 8991

I have a question regarding project enclosures (not necessarily relevant to the main MSA enclosure). I have noticed that projects built by Europeans frequently are built in tin-plate enclosures, which seem pretty convenient and easy to drill/cut for connectors, etc. US projects seem never to be in such enclosures. Some time ago, I searched for sources of tin-plate enclosures, and found just a couple, all in Europe.

What's up with tin-plate?

Sam W.

8992. Re: [spectrumanalyzer] Enclosures

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-17 02:04:27 UTC
From: Jim Hontoria
Topic: 3452 Message: 8992

There are several reasons, among others years ago aluminum was difficult to get in Europe and there were no cast, extruded or preformed boxes. All radio chassis were always tin plate and, when a teenager, I built an oscilloscope with tin plate subassemblies..

A more esoteric reason is that, since tin plate is tin coated steel, it insulates the insides from magnetic fields.

Jim, W1JGH
On Fri, Dec 16, 2011 at 7:24 PM, Sam <swetterlin@...> wrote:

> **
>
>
> I have a question regarding project enclosures (not necessarily relevant
> to the main MSA enclosure). I have noticed that projects built by Europeans
> frequently are built in tin-plate enclosures, which seem pretty convenient
> and easy to drill/cut for connectors, etc. US projects seem never to be in
> such enclosures. Some time ago, I searched for sources of tin-plate
> enclosures, and found just a couple, all in Europe.
>
> What's up with tin-plate?
>
> Sam W.
>
>
>

--
Jim G. Hontoria

8993. Re: Enclosures

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-17 07:02:38 UTC
From: undercoupled
Topic: 3452 Message: 8993

I found a roll of K&S .005" soft brass, 12" x 30" recently at a Hobby Lobby store. (Bought it) They also had small pieces of tin plate. I did not find any way to order this roll of brass material online from them. They do have a lot of other materials
The stock number of the K&S brass roll is 6010. Googling that, I found that Tower Hobbies carries the roll of brass, tin plate sheets, and most of the K&S line. Both the brass and tin plate are also at Grainger, Ebay, and Amazon. Amazon had the best price. I just searched for the stock number I had (K&S 6010), and then looked at the other K&S items the dealer had. (Phils Hobby Shop, selling through an Amazon storefront, has most of the K&S line)
Jerry

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have a question regarding project enclosures (not necessarily relevant to the main MSA enclosure). I have noticed that projects built by Europeans frequently are built in tin-plate enclosures, which seem pretty convenient and easy to drill/cut for connectors, etc. US projects seem never to be in such enclosures. Some time ago, I searched for sources of tin-plate enclosures, and found just a couple, all in Europe.
>
> What's up with tin-plate?
>
> Sam W.
>

8994. Re: translation of the MSA's web site

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-17 08:17:13 UTC
From: Michel
Topic: 8975 Message: 8994

Hi guys,

Nice French translation done, guess it was not really a piece of cake doing this in only one week.
I feel more comfortable to know there's now a French site which explains in details Scotty's MSA building, and over this all the options and details needed to have it operationnel.
Just to say in fact that it's always a little bit easier when using one's native language even if fluent in English.

Michel (Loiret)

--- In spectrumanalyzer@yahoogroups.com, marc olaniÃ© <Marc.olanie@...> wrote:
>
> Hi Scotty
>
> Just a line dropped to inform you that all the descriptions, building instructions and test procedure for the MSA have been translated into French.
>
> This translation has been made by the Electrolab Team, in Nanterre (close to Paris city), with the help of a small ham radio guys. Too much hams and â□□hardware hackersâ□□ where interested building the MSA but were afraid to be lost with a foreign language.
>
>
>
> http://wiki.electrolab.fr/Projets:Lab:2011:SA-Scotty
>
>
>
> It was quite a challenge. All the work has been done in approximately 1 week
>
>
>
> We can send you the whole contend if you need it (itâ□□s a simple Wiki structure), for you or for Canadian MSA addicts wishing to have it.
>
>
>
> Hope it will help to spread the â□□MSA Jihadâ□□ all around the world :- D
>
>
>
> Cheers
>
> Marc

>

8995. Cavity Question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-17 14:42:38 UTC
From: allenkeehall
Topic: 8975 Message: 8995

I've been finding the discussions on the cavity filter very interesting and have some questions for those who've extensively built and toyed with them. I was considering building my first one with adjusting brass rods as opposed to copper tubing inner conductors and screws. I ordered the 1/4" brass but now I'm having a few doubts since copper is undoubtedly a better conductor.

Would it be be better to plug flat the ends of the inner tube copper conductors? Could this result in easier or better tuning response from the screws?

The fact that the screws center in a null of sorts (hole in the inner copper tubing) wouldn't this be detrimental to the desired effects via fringing?

BTW, based on the results going back and forth I believe implementing the SAW is now a no brainer. Very impressive work!

Thanks in advance for your thoughts.

8996. Re: Enclosures

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-17 15:09:53 UTC
From: Sam
Topic: 3452 Message: 8996

My local hobby store stocks a lot of K&S products, but I never thought of looking there for tin plate. Ideally, I was hoping to locate an actual tin-plate chassis.

On the K&S topic, I have mentioned in the past that I use their brass for fencing and lids, but my stash of brass is unlabeled so I never know the actual thicknesses to recommend. I recently bought 0.01" sheet so I would have some of known thickness. It works great for fencing and I would not want anything thicker. Your 0.005" sheet should work well too. In fact, it is ideal to make the lids of very thin flexible brass because it makes them much easier to remove--if you heat a corner you can bend it up to release it and move on to the next area.

Pre-made brass strips don't seem to be made of anything thinner than 0.015" material, which is workable but too thick for my taste. I cut strips out of thinner sheet, which can be done with a scissors or paper cutter.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "undercoupled" <undercoupled@...> wrote:
>
> I found a roll of K&S .005" soft brass, 12" x 30" recently at a Hobby Lobby store. (Bought it) They also had small pieces of tin plate. I did not find any way to order this roll of brass material online from them. They do have a lot of other materials
> The stock number of the K&S brass roll is 6010. Googling that, I found that Tower Hobbies carries the roll of brass, tin plate sheets, and most of the K&S line. Both the brass and tin plate are also at Grainger, Ebay, and Amazon. Amazon had the best price. I just searched for the stock number I had (K&S 6010), and then looked at the other K&S items the dealer had. (Phils Hobby Shop, selling through an Amazon storefront, has most of the K&S line)
> Jerry
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > I have a question regarding project enclosures (not necessarily relevant to the main MSA enclosure). I have noticed that projects built by Europeans frequently are built in tin-plate enclosures, which seem pretty convenient and easy to drill/cut for connectors, etc. US projects seem never to be in such enclosures. Some time ago, I searched for sources of tin-plate enclosures, and found just a couple, all in Europe.
> >
> > What's up with tin-plate?
> >
> > Sam W.
> >
>

8997. Re: Cavity Question

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-17 15:22:12 UTC
From: Sam
Topic: 8975 Message: 8997

You are correct that copper will do better than brass as the center conductor, which is the place where resistance is most critical. I'm not sure it makes much difference for the outer tube or end plates.

Copper will make a little less difference than you might think. Even though it has lower resistivity than brass, the skin depth is proportional to the square root of resistivity. Net effect, if you double the resistivity the actual resistance goes up by only 40%. So a brass center rod will give somewhat worse performance, but I think it will make a perfectly useable filter.

Plugging the inner tube will probably increase the amount of capacitance created by the screw at any given setting, but won't improve performance. Fancy filters sometimes have solid rods with a hole drilled into the end so the screw can actually extend inside the rod, allowing for more capacitance and greater tuning range. (Sounds like an alignment nightmare and we don't need much range.)

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "allenkeehall" <renais_sance@...> wrote:

> I've been finding the discussions on the cavity filter very interesting and have some questions for those who've extensively built and toyed with them. I was considering building my first one with adjusting brass rods as opposed to copper tubing inner conductors and screws. I ordered the 1/4" brass but now I'm having a few doubts since copper is undoubtedly a better conductor.
>
> Would it be be better to plug flat the ends of the inner tube copper conductors? Could this result in easier or better tuning response from the screws?
>
> The fact that the screws center in a null of sorts (hole in the inner copper tubing) wouldn't this be detrimental to the desired effects via fringing?
>
> BTW, based on the results going back and forth I believe implementing the SAW is now a no brainer. Very impressive work!
>
> Thanks in advance for your thoughts.
>

8998. Re: Noise Experiment

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-17 17:46:24 UTC
From: inlinebeginner
Topic: 8913 Message: 8998

Very impressive, up to 13GHz.
I think many company provide similar attenuators. The reason that I showed you TriQuint part is that TriQuint FE sent me an eval board a while ago, to see if I could use it in some project.
Lin

--- In spectrumanalyzer@yahoogroups.com, Christian Cziezerski <neganur@...> wrote:
>
> Lin,
>
> I was looking at something similar with an Hittite HMC424LP3 (6-bit 0.5 dB
> LSB 31.5 dB DC-13 GHz)
>
> http://www.hittite.com/content/documents/data_sheet/hmc424lp3.pdf
>
> Your device has a better insertion loss, though.
>
> Chris
>
> On Sat, Dec 17, 2011 at 12:38 AM, Sam <swetterlin@...> wrote:
>
> > **
> >
> >
> > Lin,
> > That's an impressive device. But for myself, I find it a simple matter to
> > add/remove attenuators, and I don't have much use for attenuation in small
> > steps, so it wouldn't be worth the trouble.
> >
> > I did find an interesting technique in their data sheet. The evaluation
> > board has SMA end-launch connectors, and the center pins have a 0.2 pF
> > capacitors to ground "to resonate out the inductance of the connector."
> > Interesting idea, though they use thin PCB where via inductance is small; a
> > different value might be needed on 0.060" boards.
> >
> > Sam W.
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@>
> > wrote:
> > >
> > > Here is a programmable attenuator:
> > >
> > http://www.triquint.com/prodserv/more_info/proddisp.aspx?prod_id=TQP4M9072
> > >

> > > DC - 4 GHz
> > > 0.5 dB LSB Steps to 31.5dB
> > > +57 dBm Input IP3
> > > 1.6 dB Insertion Loss @ 2 GHz
> > > TTL / CMOS Compatible Serial Control Interface
> > > No requirement for external bypass capacitors for operation above 700 MHz
> > > 50 O Impedance
> > > +5V Supply Voltage
> > > 4x4mm QFN package
> > >
> > > After we add this attenuator, we may need to design an auto calibration
> > routine. Because the cases will be increased rapidly, considering all the
> > RBW combinations.
> > >
> > > Lin
> >
>

8999. Re: SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-17 20:16:14 UTC
From: Sam
Topic: 8925 Message: 8999

Neal and Scotty,

1. Did you find it necessary to cut the SAW module into two parts to get good isolation, or was it just a matter of making room for connectors?

2. The filter response seems to peak a bit above 1013.3 MHz, and appears to be broad enough that you could specify LO2=1028 MHz, putting the nominal filter at 1017.3 MHz, in which case the image at +21.4 MHz would be completely obliterated. Good idea?

3. The fencing over the SAW appears to be actually soldered to the SAW module. True?

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Neal" <nealmartini@...> wrote:
>
> Geoff,
>
> All the details are here:
>
> http://www.scottyspectrumanalyzer.com/slim_sfa_1013.html
>
> Neal
>
>
>
> From: Geoff Moore
> Sent: Wednesday, December 14, 2011 12:52 PM
> To: spectrumanalyzer@yahoogroups.com
> Subject: Re: [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step
>
>
> Neal,
>
> I've just been looking at the SAW filter folder to refresh my memory of
> parts required but I cannot see the PCB layout or values for the suggested
> pads.
>
> Am I looking in the wrong place or will this info be put in the folder
> before we all get our soldering irons hot.
>
> Judging by the response, you are going to be very busy in the next few
> weeks.
>
> Geoff
>

9000. SAW Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-17 21:35:35 UTC
From: Sam
Topic: 9000 Message: 9000

I checked the output of my diplexer to see what the max power level would be. I got -11 dBm with the MSA input power to the point where another 1 dB of input increased the diplexer output by only 0.1 dB. This took something like 10 dBm at the MSA input. So I would conclude the most it would ever be is -10 dBm. I think my Mixer 1 has relatively high loss (maybe 8 dBm) and maybe the diplexer adds a dB of loss, so maybe others could get a bit more power, such as -7 dBm.

If you fed this -7 dBm to the SAW module, there would be another 6 dB loss before the amp, yielding -13 dBm at the amp, so even with 21 dB gain in the amp the power to the subsequent SAW would only be +8 dBm. It therefore appears to me that Mixer 1 provides the needed limiting to protect the SAW from excessive power whether you use the ERA or the LEE amp. If you already have the ERA-33sm it would reasonable to use it. Otherwise the LEE-39 is still slightly better.

Sam W.

9001. Re: [spectrumanalyzer] Re: SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-17 23:23:29 UTC
From: Neal
Topic: 8925 Message: 9001

Sam,

1. Did you find it necessary to cut the SAW module into two parts to get good isolation, or was it just a matter of making room for connectors?
The shield over the center of the SAW is there for input to output isolation. This is mainly a “through the air” barrier. Additionally, if you look under the SAW on the PCB, there is a ground barrier between the SAW’s input and output pads. There are a few closely spaced vias in this barrier. Scotty wanted these there to help prevent internal FR4 path leakage. Incidentally, the reduction of the leakage improved dramatically when just this shield was installed (without any side or top shielding).

2. The filter response seems to peak a bit above 1013.3 MHz, and appears to be broad enough that you could specify LO2=1028 MHz, putting the nominal filter at 1017.3 MHz, in which case the image at +21.4 MHz would be completely obliterated. Good idea?
The peak of the response occurs at about 1014.7 MHz (similar to the SAW’s data sheet plot). The response is definitely broad enough to shift LO2 as you suggest. It is not clear how much additional rejection at the image frequency this would buy you. Using my MSA with its noise floor, I can’t tell if the ultimate rejection is being determined by the noise floor or if the filter actually has more rejection to offer.

3. The fencing over the SAW appears to be actually soldered to the SAW module. True?
I didn’t actually touch my soldering iron directly to the SAW for fear of destroying one of the few SAWs I had. What I did was used a very hot soldering iron and heated the shield above the SAW and let the solder flow down to the SAW. Scotty is assembling one of these as we speak and I think he intends to try/describe how this shield should be installed.

Neal

From: Sam
Sent: Saturday, December 17, 2011 12:16 PM
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Re: SAW 1013 MHz Filter Group Buy Next Step

Neal and Scotty,

1. Did you find it necessary to cut the SAW module into two parts to get good isolation, or was it just a matter of making room for connectors?

2. The filter response seems to peak a bit above 1013.3 MHz, and appears to be broad enough that you could specify LO2=1028 MHz, putting the nominal filter at 1017.3 MHz, in which case the image at +21.4 MHz would be completely obliterated. Good idea?

3. The fencing over the SAW appears to be actually soldered to the SAW module. True?

Sam W.

--- In mailto:spectrumanalyzer%40yahoogroups.com, "Neal" <nealmartini@...> wrote:
>

> Geoff,
>
> All the details are here:
>
> http://www.scottyspectrumanalyzer.com/slim_sfa_1013.html
>
> Neal
>
>
>
> From: Geoff Moore
> Sent: Wednesday, December 14, 2011 12:52 PM
> To: mailto:spectrumanalyzer%40yahoogroups.com
> Subject: Re: [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step
>
>
> Neal,
>
> I've just been looking at the SAW filter folder to refresh my memory of
> parts required but I cannot see the PCB layout or values for the suggested
> pads.
>
> Am I looking in the wrong place or will this info be put in the folder
> before we all get our soldering irons hot.
>
> Judging by the response, you are going to be very busy in the next few
> weeks.
>
> Geoff
>

9002. Re: SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-17 23:33:21 UTC
From: Sam
Topic: 8925 Message: 9002

Neal,
What I was thinking of regarding the module being cut in half is whether you could leave it as one piece and put a fence along the line that otherwise would be cut (probably a double-sided PCB fence). The connectors would be cramped, but if you used direct-soldered-coax to connect the amp output to the input of the dual-SAW section, you would only need two SMAs so there would be room.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Neal" <nealmartini@...> wrote:
>
> Sam,
>
> 1. Did you find it necessary to cut the SAW module into two parts to get good isolation, or was it just a matter of making room for connectors?
> The shield over the center of the SAW is there for input to output isolation. This is mainly a â□□through the airâ□□ barrier. Additionally, if you look under the SAW on the PCB, there is a ground barrier between the SAWâ□□s input and output pads. There are a few closely spaced vias in this barrier. Scotty wanted these there to help prevent internal FR4 path leakage. Incidentally, the reduction of the leakage improved dramatically when just this shield was installed (without any side or top shielding).
>
>
> 2. The filter response seems to peak a bit above 1013.3 MHz, and appears to be broad enough that you could specify LO2=1028 MHz, putting the nominal filter at 1017.3 MHz, in which case the image at +21.4 MHz would be completely obliterated. Good idea?
> The peak of the response occurs at about 1014.7 MHz (similar to the SAWâ□□s data sheet plot). The response is definitely broad enough to shift LO2 as you suggest. It is not clear how much additional rejection at the image frequency this would buy you. Using my MSA with its noise floor, I canâ□□t tell if the ultimate rejection is being determined by the noise floor or if the filter actually has more rejection to offer.
>
> 3. The fencing over the SAW appears to be actually soldered to the SAW module. True?
> I didnâ□□t actually touch my soldering iron directly to the SAW for fear of destroying one of the few SAWs I had. What I did was used a very hot soldering iron and heated the shield above the SAW and let the solder flow down to the SAW. Scotty is assembling one of these as we speak and I think he intends to try/describe how this shield should be installed.
>
> Neal
>

9003. Re: [spectrumanalyzer] Re: SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-17 23:59:21 UTC
From: Neal
Topic: 8925 Message: 9003

Sam,

Sorry, I misunderstood what you were asking. You'd have to try what your suggesting and see how effective it is. I am sure you noticed that there are not the usual number of vias on the boundary traces that other SLIMs have. There are very few on that edge of the AMP SAW board. This was done to keep the number of holes/board below the 350 required for an ExpressPCB mini board. This is not a problem when you cut the board first because you can solder the shield to the top and bottom of the PCB. I don't know if this would be a problem for what your suggesting.

Neal

From: Sam
Sent: Saturday, December 17, 2011 3:33 PM
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Re: SAW 1013 MHz Filter Group Buy Next Step

Neal,
What I was thinking of regarding the module being cut in half is whether you could leave it as one piece and put a fence along the line that otherwise would be cut (probably a double-sided PCB fence). The connectors would be cramped, but if you used direct-soldered-coax to connect the amp output to the input of the dual-SAW section, you would only need two SMAs so there would be room.
Sam W.

--- In mailto:spectrumanalyzer%40yahoogroups.com, "Neal" <nealmartini@...> wrote:
>
> Sam,
>
> 1. Did you find it necessary to cut the SAW module into two parts to get good isolation, or was it just a matter of making room for connectors?
> The shield over the center of the SAW is there for input to output isolation. This is mainly a â□□through the airâ□□ barrier. Additionally, if you look under the SAW on the PCB, there is a ground barrier between the SAWâ□□s input and output pads. There are a few closely spaced vias in this barrier. Scotty wanted these there to help prevent internal FR4 path leakage. Incidentally, the reduction of the leakage improved dramatically when just this shield was installed (without any side or top shielding).
>
>
> 2. The filter response seems to peak a bit above 1013.3 MHz, and appears to be broad enough that you could specify LO2=1028 MHz, putting the nominal filter at 1017.3 MHz, in which case the image at +21.4 MHz would be completely obliterated. Good idea?
> The peak of the response occurs at about 1014.7 MHz (similar to the SAWâ□□s data sheet plot). The response is definitely broad enough to shift LO2 as you suggest. It is not clear how much additional rejection at the image frequency this would buy you. Using my MSA with its noise floor, I canâ□□t tell if the ultimate rejection is being determined by the noise floor or if the filter actually has more rejection to offer.
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> 3. The fencing over the SAW appears to be actually soldered to the SAW module. True?
> I didnâ□□t actually touch my soldering iron directly to the SAW for fear of destroying one of the few SAWs I had. What I did was used a very hot soldering iron and heated the shield above the SAW and let the solder flow down to the SAW. Scotty is assembling one of these as we speak and I think he intends to try/describe how this shield should be installed.
>
> Neal
>

9004. Re: [spectrumanalyzer] Re: SAW 1013 MHz Filter Group Buy Next Step

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 01:03:38 UTC
From: william sprowls
Topic: 8925 Message: 9004

Hi Sam and All,
1. The sections must be cut apart so that full perimeter fencing can be used on each section. This is needed to minimize crosstalk between sections.
2. So true, PLO 2 can be run at 1028 MHz with no problem.
3. Yes, the internal fence does have a solder fillet connecting the top of the SAW. It accepts solder nicely.

I am updating the web page to include my test results while building up the SAW sections. The first part, dual SAW section should be finished later tonight, assuming the Cowboys are as depressing as they have been.
Scotty

--- On Sat, 12/17/11, Sam <swetterlin@comcast.net> wrote:

From: Sam <swetterlin@...>
Subject: [spectrumanalyzer] Re: SAW 1013 MHz Filter Group Buy Next Step
To: spectrumanalyzer@yahoogroups.com
Date: Saturday, December 17, 2011, 2:16 PM

Neal and Scotty,

1. Did you find it necessary to cut the SAW module into two parts to get good isolation, or was it just a matter of making room for connectors?

2. The filter response seems to peak a bit above 1013.3 MHz, and appears to be broad enough that you could specify LO2=1028 MHz, putting the nominal filter at 1017.3 MHz, in which case the image at +21.4 MHz would be completely obliterated. Good idea?

3. The fencing over the SAW appears to be actually soldered to the SAW module. True?

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Neal" <nealmartini@...> wrote:

>

> Geoff,

>

> All the details are here:

>

> http://www.scottyspectrumanalyzer.com/slim_sfa_1013.html

>

> Neal

>

>

>

> From: Geoff Moore

> Sent: Wednesday, December 14, 2011 12:52 PM

> To: spectrumanalyzer@yahoogroups.com

> Subject: Re: [spectrumanalyzer] SAW 1013 MHz Filter Group Buy Next Step

>

>

> Neal,

>

> I've just been looking at the SAW filter folder to refresh my memory of

> parts required but I cannot see the PCB layout or values for the suggested

> pads.

>

> Am I looking in the wrong place or will this info be put in the folder

> before we all get our soldering irons hot.

>

> Judging by the response, you are going to be very busy in the next few

> weeks.

>

> Geoff

>

9005. Re: Cavity filter construction (Len's soldering hints and secrets)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 01:13:40 UTC
From: Len
Topic: 9005 Message: 9005

Hello Group

At the moment I am building MSA coax filters serial numbers 31 to 45, including 3 kits

From the official Wiki Leaks:

>>>>>>>>>>>>>>>

(1) Top and bottom plates are 1mm copper or 25 thou or 1/40" or gauge xxx

The pipes are so stiff a thinner "flexible" top and base plate is actually good not bad.

(2) The first soldering/brazing step is to use plumber's Silver 15% rods to braze the 4 tubes together.

Of course the Pipes are already machined to size with hairpin loop holes in them .

Brazing temperature is well over >> 1000F, >>700C with a MAPGAS flame.

(3) There is a jig for clamping them all together while this happens.

A single steel rod through all the hairpin holes lines all the pipes up nicely and keeps the holes open.

(4) The copper is now all black, clean them by soaking them alternatively in Vinegar and or de-scaling agent.

Then polish them back up with emery cloth wet and dry sanding paper.

The brazing exercise is the key.

The pipe assembly is now proof against excess soldering heat and other timing disasters.

Further soldering on the bottom, top, sides can never ever loosen the pipes or expose the coupling holes!!

>>>>>>>>>>>

Happy to sell just the 4 machined pipes brazed together with all hairpin loops holes and polished.

Price U$ 28 plus approx U$ 20 post from Perth Australia to the rest of the world.

The post cost is high, Perth WA is roughly on the opposite side of the world to New York.

See also my photos and kit instruction notes in my group files or e-mail me and I will send it.

Regards

Len Spyker

9006. SAW Evaluation

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 03:56:38 UTC
From: william
Topic: 9006 Message: 9006

Hi All,
I have just updated the SAW web page:
http://scottyspectrumanalyzer.com/slim_sfa_1013.html

I added a section at the bottom of the page called:
Test, Evaluation, and Characterization
It is basically notes and pictures and graphs as I build and evaluate the module. The only surprise I got was how small the SAW is. The data I have taken is very close to Neal's.
Scotty

9007. RE: [spectrumanalyzer] Re: Enclosures

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 04:23:42 UTC
From: Jacques SCHERER
Topic: 3452 Message: 9007
Attachments: 2 described; binary payloads are missing from this source WARC

Hello,

In Europe , one of our suppliers is M. SCHUBERT,

please find her site here : http://www.schubert-gehaeuse.de/

Regards,

Jacques ☐ F1APY

De : spectrumanalyzer@yahoogroups.com
[mailto:spectrumanalyzer@yahoogroups.com] De la part de Sam
Envoyé : samedi 17 décembre 2011 16:10
À : spectrumanalyzer@yahoogroups.com
Objet : [spectrumanalyzer] Re: Enclosures

My local hobby store stocks a lot of K&S products, but I never thought of looking there for tin plate. Ideally, I was hoping to locate an actual tin-plate chassis.

On the K&S topic, I have mentioned in the past that I use their brass for fencing and lids, but my stash of brass is unlabeled so I never know the actual thicknesses to recommend. I recently bought 0.01" sheet so I would have some of known thickness. It works great for fencing and I would not want anything thicker. Your 0.005" sheet should work well too. In fact, it is ideal to make the lids of very thin flexible brass because it makes them much easier to remove--if you heat a corner you can bend it up to release it and move on to the next area.

Pre-made brass strips don't seem to be made of anything thinner than 0.015" material, which is workable but too thick for my taste. I cut strips out of thinner sheet, which can be done with a scissors or paper cutter.

Sam W.

--- In spectrumanalyzer@yahoogroups.com
<mailto:spectrumanalyzer%40yahoogroups.com> , "undercoupled"
<undercoupled@...> wrote:
>
> I found a roll of K&S .005" soft brass, 12" x 30" recently at a Hobby Lobby store. (Bought it) They also had small pieces of tin plate. I did not find any way to order this roll of brass material online from them. They do have a lot of other materials
> The stock number of the K&S brass roll is 6010. Googling that, I found that Tower Hobbies carries the roll of brass, tin plate sheets, and most of the K&S line. Both the brass and tin plate are also at Grainger, Ebay, and

Amazon. Amazon had the best price. I just searched for the stock number I had (K&S 6010), and then looked at the other K&S items the dealer had. (Phils Hobby Shop, selling through an Amazon storefront, has most of the K&S line)
> Jerry
>
> --- In spectrumanalyzer@yahoogroups.com
<mailto:spectrumanalyzer%40yahoogroups.com> , "Sam" <swetterlin@> wrote:
> >
> > I have a question regarding project enclosures (not necessarily relevant to the main MSA enclosure). I have noticed that projects built by Europeans frequently are built in tin-plate enclosures, which seem pretty convenient and easy to drill/cut for connectors, etc. US projects seem never to be in such enclosures. Some time ago, I searched for sources of tin-plate enclosures, and found just a couple, all in Europe.
> >
> > What's up with tin-plate?
> >
> > Sam W.
> >
>

9008. Cleaning PWB's

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 07:48:31 UTC
From: Steve
Topic: 9008 Message: 9008

Scotty,

The *Construction Techniques* *Using SLIMs *web page has a sentence which reads "When completed, wash and clean the board with isopropyl alcohol (90 % or better)."

How does one do the cleaning? Scrub with a toothbrush? Immerse and slosh in IPA? Pressure wash with IPA? Other?

Is there anything to observe to indicate the PWB is acceptably clean?

I have noticed that IPA (90% is all I can find in this area) seems to "melt" the edges of the PWB a little. To the extent that the edges are sticky for a while. They seem to eventually "dry" and harden and are no longer sticky. Have you noticed that?

Thanks.

Steve K8JQ

--
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http://patriotpost.us/subscription/

9009. Re: [spectrumanalyzer] Cleaning PWB's

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 07:53:46 UTC
From: William Dillon
Topic: 9008 Message: 9009

One thing I've noticed recently is that the solder flux is still in suspension in the alcohol. It's important to remove it as best as you can. I use an air duster or compressed air to blow the fluid off. Otherwise, when the alcohol evaporates, the flux will be re-deposited on the board and it feels quite sticky. Also, I've seen that someone suggested using an ultrasonic jewelry cleaner with the alcohol.

- Will

On Dec 17, 2011, at 11:48 PM, Steve wrote:

> Scotty,
>
> The *Construction Techniques* *Using SLIMs *web page has a sentence
> which reads "When completed, wash and clean the board with isopropyl
> alcohol (90 % or better)."
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> How does one do the cleaning? Scrub with a toothbrush? Immerse and slosh
> in IPA? Pressure wash with IPA? Other?
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> Is there anything to observe to indicate the PWB is acceptably clean?
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> sticky for a while. They seem to eventually "dry" and harden and are no
> longer sticky. Have you noticed that?
>
> Thanks.
>
> Steve K8JQ
>
> --
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>
>

9010. Re: Cleaning PWB's

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 12:25:12 UTC
From: Greg Broburg
Topic: 9008 Message: 9010

Yes, agreed, a single alcohol solution leaves a lot of residual flux.

My vote is to do a four step cleaning finishing with water. First step is alcohol second step is aqueous saponifier third step is tap water, fourth step is deionized water. Simpler method is a first step of alcohol followed by a second step of fresh alcohol to dilute and remove residuals from the first wash followed by water with dishwashing liquid. Saponifier is a water soluble solution (I believe that it is similar to lye) that is added to hot water (I used a hot plate with a pyrex glass cooking pan on the plate) the saponifier is very aggressive to solder fluxes. You will need gloves. It will burn holes in your clothing. Only a capful of the stuff goes in a quart of water. Finish cleaning in water with dishwashing liquid followed by water followed by DI water if desired.

Greg

On 12/18/2011 1:53 AM, William Dillon wrote:
>
> One thing I've noticed recently is that the solder flux is still in
> suspension in the alcohol. It's important to remove it as best as you
> can. I use an air duster or compressed air to blow the fluid off.
> Otherwise, when the alcohol evaporates, the flux will be re-deposited
> on the board and it feels quite sticky. Also, I've seen that someone
> suggested using an ultrasonic jewelry cleaner with the alcohol.
>
>
> - Will
>
> On Dec 17, 2011, at 11:48 PM, Steve wrote:
>
>> Scotty,
>>
>> The *Construction Techniques* *Using SLIMs *web page has a sentence
>> which reads "When completed, wash and clean the board with isopropyl
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>> sticky for a while. They seem to eventually "dry" and harden and are no
>> longer sticky. Have you noticed that?
>>

>> Thanks.
>>
>> Steve K8JQ
>>

9011. Re: [spectrumanalyzer] Cleaning PWB's

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 13:56:46 UTC
From: william sprowls
Topic: 9008 Message: 9011

Hi Steve,
 You could use a toothbrush but it too large. Go to the hardware store, plumber's section and ask for "acid brushes". Also called "flux brush". Used to apply flux to copper tubing before soldering. They are cheap, about 20 cents. Get several. The bristles are about 1 inch long. Cut them back to 1/2 inch, making the brush stiffer.

You are not experiencing "melting". If it is sticky, that is the flux.

Here is the best method for cleaning.
Lay out 3 small containers to hold the alcohol. I use the little plastic containers that hold the icing in the cinnamon rolls. About a teaspoon in the first. Just a few drops in the other two. Use 3 acid brushes, one for each. This prevents cross contamination.
1. Use enough alcohol from the first to well saturate the components. Drown them. Let the unit sit for a minute to let the flux soften. Then scrub. Use a paper towel to absorb the "wash". Repeat twice.
2. Use brush 2 and container 2 and scrub again. Use clean area of paper towel to blot up the "wash".
3. Use brush 3 and container 3 and scrub again. Use clean area of paper towel to blot up the "wash".
Let the unit dry naturally. You can "fan" it, but do not blow on it. After drying hold unit and look for "stains", "rings" around components, etc. If you see anything, it is not clean. Visual inspection under components is impossible, but if there is any flux under them, the "rings" are a giveaway.

Also, go to your pharmacist and ask for "pure" isopropyl. He may direct you to 99 or 100 %. I get my 99% at Kroger (aka Safeway or Piggly Wiggly).

I use absolutely no other chemicals.

--- On Sun, 12/18/11, Steve <steve65@suddenlink.net> wrote:

From: Steve <steve65@...>
Subject: [spectrumanalyzer] Cleaning PWB's
To: spectrumanalyzer@yahoogroups.com
Date: Sunday, December 18, 2011, 1:48 AM

Scotty,

The *Construction Techniques* *Using SLIMs *web page has a sentence

which reads "When completed, wash and clean the board with isopropyl

alcohol (90 % or better)."

How does one do the cleaning? Scrub with a toothbrush? Immerse and slosh

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Is there anything to observe to indicate the PWB is acceptably clean?

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Thanks.

Steve K8JQ

--

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9012. Re: Cleaning PWB's

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 15:02:27 UTC
From: Sam
Topic: 9008 Message: 9012

I use a similar procedure. A toothbrush has worked fine for me but the flux brushes probably have finer bristles. The flux brushes are also sold in hobby stores in packages of 10 or so for general purpose use; they are just a metal tube crimped onto the bristles. Whatever brush you use, it is important to wiggle it as you move around to work it into small spaces. If you just brush back and forth, there will be "shadow" areas next to every component, where the brush didn't reach.

The blotting step is also critical, because if you just let the excess alcohol dry, everything dissolved in it will just redeposit. I'm also paranoid about static, so don't rub with the paper towel (which will also rip pieces off it); just dab. I also do it at my laundry sink where I can periodically touch the spigot to get grounded.

For each step I just pour alcohol from the bottle and let some run off the board. A bit more wasteful, perhaps. For the third step, I don't use the brush; I just pour on extra alcohol.

90% alcohol is readily available (Target) and works well. 70% is even more common but you don't want that if you have a choice. I've never seen 100%.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> Hi Steve,
> Â You could use a toothbrush but it too large. Go to the hardware store, plumber's section and ask for "acid brushes". Also called "flux brush". Used to apply flux to copper tubing before soldering. They are cheap, about 20 cents. Get several. The bristles are about 1 inch long. Cut them back to 1/2 inch, making the brush stiffer.
>
> You are not experiencing "melting". If it is sticky, that is the flux.
>
> Here is the best method for cleaning.
> Lay out 3 small containers to hold the alcohol. I use the little plastic containers that hold the icing in the cinnamon rolls. About a teaspoon in the first. Just a few drops in the other two. Use 3 acid brushes, one for each. This prevents cross contamination.
> 1. Use enough alcohol from the first to well saturate the components. Drown them. Let the unit sit for a minute to let the flux soften. Then scrub. Use a paper towel to absorb the "wash". Repeat twice.
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>
> Also, go to your pharmacist and ask for "pure" isopropyl. He may direct you to 99 or 100
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>
> I use absolutely no other chemicals.
>
> --- On Sun, 12/18/11, Steve <steve65@...> wrote:
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> From: Steve <steve65@...>
> Subject: [spectrumanalyzer] Cleaning PWB's
> To: spectrumanalyzer@yahoogroups.com
> Date: Sunday, December 18, 2011, 1:48 AM
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> Thanks.
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>
> Steve K8JQ
>
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9013. Re: [spectrumanalyzer] Cleaning PWB's

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 15:13:05 UTC
From: Steve
Topic: 9008 Message: 9013

Scotty (and others),

Thanks for the advice. I've have been cleaning my PWB's with a toothbrush and 90% isopropyl alcohol, but not as rigorously as you guys describe. My new year's resolution is to do better :-)

By way of background (and perhaps motivation), what is the reason for such thorough cleaning? What are the consequences of not cleaning the board at all or of doing a less than stellar job?

Steve K8JQ

On 12/18/2011 8:56 AM, william sprowls wrote:
>
>
> Hi Steve,
> You could use a toothbrush but it too large. Go to the hardware
> store, plumber's section and ask for "acid brushes". Also called "flux
> brush". Used to apply flux to copper tubing before soldering. They are
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> paper towel to blot up the "wash".
> 3. Use brush 3 and container 3 and scrub again. Use clean area of
> paper towel to blot up the "wash".
> Let the unit dry naturally. You can "fan" it, but do not blow on it.
> After drying hold unit and look for "stains", "rings" around
> components, etc. If you see anything, it is not clean. Visual
> inspection under components is impossible, but if there is any flux
> under them, the "rings" are a giveaway.
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> Also, go to your pharmacist and ask for "pure" isopropyl. He may
> direct you to 99 or 100 %. I get my 99% at Kroger (aka Safeway or
> Piggly Wiggly).
>

> I use absolutely no other chemicals.
>
> --- On *Sun, 12/18/11, Steve /<steve65@...>/* wrote:
>
>
> From: Steve <steve65@...>
> Subject: [spectrumanalyzer] Cleaning PWB's
> To: spectrumanalyzer@yahoogroups.com
> Date: Sunday, December 18, 2011, 1:48 AM
>
> Scotty,
>
> The *Construction Techniques* *Using SLIMs *web page has a sentence
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> Thanks.
>
> Steve K8JQ
>
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9014. Re: Cleaning PWB's

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 15:18:37 UTC
From: Sam
Topic: 9008 Message: 9014

Greg,
Sounds a bit too heavy duty. However, it might be a great idea for cleaning the cavity filter. I used plumber's solder and that flux is very hard to clean off. Perhaps "saponifier" (a/k/a lye, Drano and garage degreaser fluid) would be perfect for that.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, Greg Broburg <semiflex@...> wrote:
>
> Yes, agreed, a single alcohol solution leaves a lot of residual flux.
>
> My vote is to do a four step cleaning finishing with water. First step
> is alcohol second step is aqueous saponifier third step is tap water,
> fourth step is deionized water. Simpler method is a first step of
> alcohol followed by a second step of fresh alcohol to dilute and remove
> residuals from the first wash followed by water with dishwashing liquid.
> Saponifier is a water soluble solution (I believe that it is similar to
> lye) that is added to hot water (I used a hot plate with a pyrex glass
> cooking pan on the plate) the saponifier is very aggressive to solder
> fluxes. You will need gloves. It will burn holes in your clothing. Only
> a capful of the stuff goes in a quart of water. Finish cleaning in water
> with dishwashing liquid followed by water followed by DI water if desired.
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> Greg
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> On 12/18/2011 1:53 AM, William Dillon wrote:
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> > One thing I've noticed recently is that the solder flux is still in
> > suspension in the alcohol. It's important to remove it as best as you
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> > - Will
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> >> longer sticky. Have you noticed that?
> >>
> >> Thanks.
> >>
> >> Steve K8JQ
> >>
>

9015. Re: Cleaning PWB's

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 15:24:56 UTC
From: Sam
Topic: 9008 Message: 9015

In most cases, it is purely cosmetic, but in some cases it may prevent corrosion. And in some cases the flux is slightly conductive and causes problems--especially a problem for PLL's. In fact, on my PLL control loop components I did an extra cleaning with acetone, though I did not notice a difference.

There is a type of flux called "No Clean" which is supposedly non-conductive so you don't have to clean it off. But it still leaves a residue so I clean it anyway.

Finally, if you solder with solder paste and hot air, it is not uncommon to get a number of tiny solder balls stuck in flux, which have the potential to cause trouble, and the scrubbing removes them.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Steve <steve65@...> wrote:
>
> Scotty (and others),
>
> Thanks for the advice. I've have been cleaning my PWB's with a
> toothbrush and 90% isopropyl alcohol, but not as rigorously as you guys
> describe. My new year's resolution is to do better :-)
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> By way of background (and perhaps motivation), what is the reason for
> such thorough cleaning? What are the consequences of not cleaning the
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> Steve K8JQ
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> On 12/18/2011 8:56 AM, william sprowls wrote:
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> >
> > Hi Steve,
> > You could use a toothbrush but it too large. Go to the hardware
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> > scrub. Use a paper towel to absorb the "wash". Repeat twice.
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> > Also, go to your pharmacist and ask for "pure" isopropyl. He may
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> > Piggly Wiggly).
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> > I use absolutely no other chemicals.
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> > --- On *Sun, 12/18/11, Steve /<steve65@...>/* wrote:
> >
> >
> > From: Steve <steve65@...>
> > Subject: [spectrumanalyzer] Cleaning PWB's
> > To: spectrumanalyzer@yahoogroups.com
> > Date: Sunday, December 18, 2011, 1:48 AM
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> > Scotty,
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> > Thanks.
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> > Steve K8JQ
> >
> > --

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9016. Re: [spectrumanalyzer] Cleaning PWB's

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 18:24:22 UTC
From: William Dillon
Topic: 9008 Message: 9016

Also, some fluxes are very slightly conductive. By throughly cleaning it off you can ensure that you're not getting additional leakage from the solder flux.

On Dec 18, 2011, at 4:25 AM, Greg Broburg wrote:

> Yes, agreed, a single alcohol solution leaves a lot of residual flux.
>
> My vote is to do a four step cleaning finishing with water. First step is alcohol second step is aqueous saponifier third step is tap water, fourth step is deionized water. Simpler method is a first step of alcohol followed by a second step of fresh alcohol to dilute and remove residuals from the first wash followed by water with dishwashing liquid. Saponifier is a water soluble solution (I believe that it is similar to lye) that is added to hot water (I used a hot plate with a pyrex glass cooking pan on the plate) the saponifier is very aggressive to solder fluxes. You will need gloves. It will burn holes in your clothing. Only a capful of the stuff goes in a quart of water. Finish cleaning in water with dishwashing liquid followed by water followed by DI water if desired.
>
> Greg
>
> On 12/18/2011 1:53 AM, William Dillon wrote:
>
>>
>> One thing I've noticed recently is that the solder flux is still in suspension in the alcohol. It's important to remove it as best as you can. I use an air duster or compressed air to blow the fluid off. Otherwise, when the alcohol evaporates, the flux will be re-deposited on the board and it feels quite sticky. Also, I've seen that someone suggested using an ultrasonic jewelry cleaner with the alcohol.
>>
>>
>> - Will
>>
>> On Dec 17, 2011, at 11:48 PM, Steve wrote:
>>
>>>
>>> Scotty,
>>>
>>> The *Construction Techniques* *Using SLIMs *web page has a sentence
>>> which reads "When completed, wash and clean the board with isopropyl
>>> alcohol (90 % or better)."
>>>
>>> How does one do the cleaning? Scrub with a toothbrush? Immerse and slosh
>>> in IPA? Pressure wash with IPA? Other?
>>>
>>> Is there anything to observe to indicate the PWB is acceptably clean?
>>>

>>> I have noticed that IPA (90% is all I can find in this area) seems to
>>> "melt" the edges of the PWB a little. To the extent that the edges are
>>> sticky for a while. They seem to eventually "dry" and harden and are no
>>> longer sticky. Have you noticed that?
>>>
>>> Thanks.
>>>
>>> Steve K8JQ
>>>
>
>
>

9017. Re: [spectrumanalyzer] Re: Cleaning PWB's

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 18:53:10 UTC
From: Don Hackler
Topic: 9008 Message: 9017

On Dec 18, 2011, at 7:18 AM, Sam wrote:

> Greg,
> Sounds a bit too heavy duty. However, it might be a great idea for cleaning the cavity filter. I used plumber's solder and that flux is very hard to clean off. Perhaps "saponifier" (a/k/a lye, Drano and garage degreaser fluid) would be perfect for that.
> Sam W.

For the cavity filters, you might use a technique we use when silver soldering large (6" and 8") TV broadcast transmission lines.

After silver soldering, we use Naval Jelly to break down the flux and corroded copper, ScotchBrite pads and emery cloth to scrub everything clean, and then rinse with a baking soda solution to neutralize the acidic Naval Jelly, finally rinsing and wiping down everything with clean water.

9018. Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 20:17:41 UTC
From: Sam
Topic: 9018 Message: 9018

I have now actually installed an amp in front of my cavity filter (ERA-33 attenuated down to 7 dB gain). I'm guessing the performance of this with the cavity filter will be similar to the performance of the SAW module with its internal amp.

I recalibrated, though my calibration is not extremely precise because I did it with my MSA upside down with the bottom off and the fan not running, so it was never at thermal equilibrium.

My minimum visible signal with 600 kHz RBW is -122 dBm. My goal was to get a stable signal at -120 dBm. Such signal is now very visible, and if I place a marker on it, the value varies (noise) from scan to scan by about 2 dB. As far as I am concerned, that is excellent accuracy for such a low level signal. I can actually get a measurable response below -128 dBm, but if the ADC change per dB is too small, a small bit of noise creates a very erratic graph. So I calibrated down to -128 dBm, but I don't expect much accuracy under -120 dBm.

On the high end, I was aiming for useable but not great response at 0 dBm. I get very strong response at -5 dBm and decent response at 0 dBm, and was able to calibrate to 6 dBm with the ADC values still increasing a useful amount.

This is all in my 600 Hz RBW path. For wider paths, I lose a couple dB at the high end and varying amounts on the low end.

In summary, I have a solid response from -120 dBm to 0 dBm, with at least 5 dB of lesser response added on to each end.

Sam W.

9019. Re: Cleaning PWB's

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 21:41:19 UTC
From: undercoupled
Topic: 9008 Message: 9019

About cleaning cavity filters:

I built a few cavity filters, 2, 4, and 5 cavity types with a variety of tuning methods as experiments. I also used silver brazing rod to hold the tubes together permanently, as Len did in his production run. The high heat heavily oxidized the inside of the tube. After slicing and blistering my fingers trying to polish the inside by hand, I made a tool. A scrap of steel rod about 0.18"diam, folded and hammered flat, with about 0.15" clearance between the folded portion. The folded length is about 7" long. I ground a chisel point onto the end of a small bolt (1/4" diam) , cut the bolt head off, and welded the chiseled end into the open end of the folded rod.
The bolt goes into a drill chuck. A sheet of Scotchbrite goes into the slot, centered. Insert tool into the tube and polish. It worked but wore out the Scotchbrite quickly. Next try was wrapping a sheet of sandpaper with the Scotchbrite, with the sandpaper exposed, doing the abrasion. Works great. Finish with finer sandpaper, and then with just the Scotchbrite.
My materials and dimensions were purely arbitrary, and were whatever was in my garage. This method could probably be done with just a doubled wire in a hand drill. Use low speed to avoid vibration.
Jerry

--- In spectrumanalyzer@yahoogroups.com, Don Hackler <donh@...> wrote:
>
>
> On Dec 18, 2011, at 7:18 AM, Sam wrote:
>
> > Greg,
> > Sounds a bit too heavy duty. However, it might be a great idea for cleaning the cavity filter. I used plumber's solder and that flux is very hard to clean off. Perhaps "saponifier" (a/k/a lye, Drano and garage degreaser fluid) would be perfect for that.
> > Sam W.
>
>
> For the cavity filters, you might use a technique we use when silver soldering large (6" and 8") TV broadcast transmission lines.
>
> After silver soldering, we use Naval Jelly to break down the flux and corroded copper, ScotchBrite pads and emery cloth to scrub everything clean, and then rinse with a baking soda solution to neutralize the acidic Naval Jelly, finally rinsing and wiping down everything with clean water.
>

9020. Re: My 2nd cavity filter performance, 3.98dB insertion loss

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 23:34:07 UTC
From: inlinebeginner
Topic: 8964 Message: 9020

I just created three more cavity filters, the performance is almost identical. 4.3dB insertion loss. The photo is here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/2050934276/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc

One test I did is that how important the inner surface cleaning. The one I did not clean the top plate, bottom plate and the center stubs got about 0.3dB more insertion loss, with a little bit narrow BW. I think the surface cleaning may not that important, the 0.3dB degradation may come from the under-coupling, according to the measured BW number.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Lin,
> Regarding your comment on calibration. If you are trying to distinguish between 4.0 and 4.3 dB, it is absolutely critical to have an attenuator on the MSA input to make the input return loss as high as possible. This is especially true if the signal source may be very reflective. Otherwise, reflections between the MSA and the signal source can affect the measurement. (Alternatively, you could view the attenuator as part of the cavity, improving its output return loss.)
>
> Likewise, when you do the initial calibration, your signal source must have high return loss or you must use a good attenuator.
>
> In addition to the issue of reflections at the signal frequency, there are high frequency components that leak out the MSA input and may or may not get reflected back in, and an attenuator deals with these. I have pointed out in the past that if I measure a signal from a 50 ohm signal generator with and without a 1 GHz low pass filter, I get a 0.5 dB higher signal level with the filter, suggesting that the filter has negative insertion loss (i.e. gain). That is due to the LPF reflecting the high frequency components (mostly LO1) back in to the MSA.
>
> It is quite easy to have a signal source that has reasonable return loss at the signal frequency, but bad return loss above 1 or 2 GHz, so the high frequency effect can catch you by surprise.
>
> You can drive yourself crazy trying to resolve discrepancies of 0.3 dB, but a good attenuator on the MSA input can eliminate some such problems. Many commercial attenuators I have tested are not that great with regard to return loss--e.g. their DC input resistance when properly terminated might be 47 ohms. So you have to make your own or test the commercial ones. Of course, you can use the MSA to do the test.
>
> Sam W.
>
>

> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Today I measured with HP VAN, the insertion loss I got is 4.3dB. Looks like my MSA did not calibrate well above 1GHz in 1G band.
> > Anyway, 4.3dB is still better than 7.1dB, which is what I got on my firts cavity filter.
> > The interesting thing I experenced is that I disassembled this cavity filter after I first time assembled it completely. Because I saw a 20dB insertion loss. I removed the top and bottom end plates and checked hairpins, and found the center one was short to ground, due to the wrong material I used for spacers, they are melt at high temperature. I changed tje spacers and put the top and bottom end plates back, it works very well.
> > Lin
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > Lin,
> > > Very nice. That's about as good as it gets.
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > >
> > > > I just build my 2nd cavity filter, the insertion loss: 3.98dB. It is much better than my 1st one built about 1.5 years ago.
> > > > The test result is here:
> > > >
> > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/387914832/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
> > > >
> > > > The over all rejection is here:
> > > >
> > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1777865914/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
> > > >
> > > > Photo is here:
> > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/608225844/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
> > > >
> > > > Lin
> > > >
> > >
> >
>

9021. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-18 23:42:37 UTC
From: inlinebeginner
Topic: 9018 Message: 9021

Sam
This is achieved only with your expended log detector. If someone use Scotty's original IFA1+IFA2 and a 1kHz RBW filter, it may not reach -120dBm.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have now actually installed an amp in front of my cavity filter (ERA-33 attenuated down to 7 dB gain). I'm guessing the performance of this with the cavity filter will be similar to the performance of the SAW module with its internal amp.
>
> I recalibrated, though my calibration is not extremely precise because I did it with my MSA upside down with the bottom off and the fan not running, so it was never at thermal equilibrium.
>
> My minimum visible signal with 600 kHz RBW is -122 dBm. My goal was to get a stable signal at -120 dBm. Such signal is now very visible, and if I place a marker on it, the value varies (noise) from scan to scan by about 2 dB. As far as I am concerned, that is excellent accuracy for such a low level signal. I can actually get a measurable response below -128 dBm, but if the ADC change per dB is too small, a small bit of noise creates a very erratic graph. So I calibrated down to -128 dBm, but I don't expect much accuracy under -120 dBm.
>
> On the high end, I was aiming for useable but not great response at 0 dBm. I get very strong response at -5 dBm and decent response at 0 dBm, and was able to calibrate to 6 dBm with the ADC values still increasing a useful amount.
>
> This is all in my 600 Hz RBW path. For wider paths, I lose a couple dB at the high end and varying amounts on the low end.
>
> In summary, I have a solid response from -120 dBm to 0 dBm, with at least 5 dB of lesser response added on to each end.
>
> Sam W.
>

9022. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 01:17:56 UTC
From: jghbeta
Topic: 9018 Message: 9022

How is the response at +21.4?

Jim, W1JGH

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have now actually installed an amp in front of my cavity filter (ERA-33 attenuated down to 7 dB gain). I'm guessing the performance of this with the cavity filter will be similar to the performance of the SAW module with its internal amp.
>
> I recalibrated, though my calibration is not extremely precise because I did it with my MSA upside down with the bottom off and the fan not running, so it was never at thermal equilibrium.
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> My minimum visible signal with 600 kHz RBW is -122 dBm. My goal was to get a stable signal at -120 dBm. Such signal is now very visible, and if I place a marker on it, the value varies (noise) from scan to scan by about 2 dB. As far as I am concerned, that is excellent accuracy for such a low level signal. I can actually get a measurable response below -128 dBm, but if the ADC change per dB is too small, a small bit of noise creates a very erratic graph. So I calibrated down to -128 dBm, but I don't expect much accuracy under -120 dBm.
>
> On the high end, I was aiming for useable but not great response at 0 dBm. I get very strong response at -5 dBm and decent response at 0 dBm, and was able to calibrate to 6 dBm with the ADC values still increasing a useful amount.
>
> This is all in my 600 Hz RBW path. For wider paths, I lose a couple dB at the high end and varying amounts on the low end.
>
> In summary, I have a solid response from -120 dBm to 0 dBm, with at least 5 dB of lesser response added on to each end.
>
> Sam W.
>

9023. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 02:27:56 UTC
From: inlinebeginner
Topic: 9018 Message: 9023

Sam
If we can find a VGA working at 1013.3MHz, we might be able to apply the similar concept of the expended log detector on cavity filter amplifier. i.e. the gain is controlled with the log detector output, at hihger power input, the gain dropes more and at lower power the gain increases more. In this way, we can have larger dynamic range. The overall is a IF amplifer at 1013.3MHz but the BW is determined by the RBW filters.
Lin

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> How is the response at +21.4?
>
> Jim, W1JGH
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > I have now actually installed an amp in front of my cavity filter (ERA-33 attenuated down to 7 dB gain). I'm guessing the performance of this with the cavity filter will be similar to the performance of the SAW module with its internal amp.
> >
> > I recalibrated, though my calibration is not extremely precise because I did it with my MSA upside down with the bottom off and the fan not running, so it was never at thermal equilibrium.
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> > My minimum visible signal with 600 kHz RBW is -122 dBm. My goal was to get a stable signal at -120 dBm. Such signal is now very visible, and if I place a marker on it, the value varies (noise) from scan to scan by about 2 dB. As far as I am concerned, that is excellent accuracy for such a low level signal. I can actually get a measurable response below -128 dBm, but if the ADC change per dB is too small, a small bit of noise creates a very erratic graph. So I calibrated down to -128 dBm, but I don't expect much accuracy under -120 dBm.
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> > On the high end, I was aiming for useable but not great response at 0 dBm. I get very strong response at -5 dBm and decent response at 0 dBm, and was able to calibrate to 6 dBm with the ADC values still increasing a useful amount.
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> > This is all in my 600 Hz RBW path. For wider paths, I lose a couple dB at the high end and varying amounts on the low end.
> >
> > In summary, I have a solid response from -120 dBm to 0 dBm, with at least 5 dB of lesser response added on to each end.
> >
> > Sam W.
> >
>

9024. Re: [spectrumanalyzer] Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 13:50:40 UTC
From: Jim Hontoria
Topic: 9018 Message: 9024

How would you calibrate?

Jim G. Hontoria

Sent from my iPhone

On Dec 18, 2011, at 9:27 PM, "inlinebeginner" <inlinebeginner@...> wrote:

> Sam
> If we can find a VGA working at 1013.3MHz, we might be able to apply the similar concept of the expended log detector on cavity filter amplifier. i.e. the gain is controlled with the log detector output, at hihger power input, the gain dropes more and at lower power the gain increases more. In this way, we can have larger dynamic range. The overall is a IF amplifer at 1013.3MHz but the BW is determined by the RBW filters.
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
> >
> > How is the response at +21.4?
> >
> > Jim, W1JGH
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > I have now actually installed an amp in front of my cavity filter (ERA-33 attenuated down to 7 dB gain). I'm guessing the performance of this with the cavity filter will be similar to the performance of the SAW module with its internal amp.
> > >
> > > I recalibrated, though my calibration is not extremely precise because I did it with my MSA upside down with the bottom off and the fan not running, so it was never at thermal equilibrium.
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> > >
> > > Sam W.
> > >
> >
>
>

9025. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 14:21:28 UTC
From: inlinebeginner
Topic: 9018 Message: 9025

Calibration may not be a problem, because what we see from high RF VGA input is a log detector with larger dynamic range. Therefore, the calibration would be the same as is.
Lin
--- In spectrumanalyzer@yahoogroups.com, Jim Hontoria <jghalpha@...> wrote:
>
> How would you calibrate?
>
> Jim G. Hontoria
>
> Sent from my iPhone
>
> On Dec 18, 2011, at 9:27 PM, "inlinebeginner" <inlinebeginner@...> wrote:
>
> > Sam
> > If we can find a VGA working at 1013.3MHz, we might be able to apply the similar concept of the expended log detector on cavity filter amplifier. i.e. the gain is controlled with the log detector output, at hihger power input, the gain dropes more and at lower power the gain increases more. In this way, we can have larger dynamic range. The overall is a IF amplifer at 1013.3MHz but the BW is determined by the RBW filters.
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
> > >
> > > How is the response at +21.4?
> > >
> > > Jim, W1JGH
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >
> > > > I have now actually installed an amp in front of my cavity filter (ERA-33 attenuated down to 7 dB gain). I'm guessing the performance of this with the cavity filter will be similar to the performance of the SAW module with its internal amp.
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> > > > I recalibrated, though my calibration is not extremely precise because I did it with my MSA upside down with the bottom off and the fan not running, so it was never at thermal equilibrium.
> > > >
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> > > >

> > > > On the high end, I was aiming for useable but not great response at 0 dBm. I get very strong response at -5 dBm and decent response at 0 dBm, and was able to calibrate to 6 dBm with the ADC values still increasing a useful amount.
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> > > >
> > > > Sam W.
> > > >
> > >
> >
> >
>

9026. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 14:35:23 UTC
From: Sam
Topic: 9018 Message: 9026

Lin,
A fundamental limitation of the VGA+log detector concept is that you can't allow signals to reach the VGA unless they will also reach the log detector. Otherwise, a strong signal can overload the VGA without the log detector knowing about it. That is the reason I use the arrangement RBW Filters->VGA->Noise Filter->log detector, with the Noise Filter always broader bandwidth than the RBW filter.

You actually could violate this rule for VNA use only, as long as there would never be a spurious signal strong enough to overload the VGA. That might be the case with a VGA located after the cavity filter (maybe even before the cavity) as long as the VGA never had gain greater than 30 dB or so. (The prime overload risk would come from leaked LO1.)

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> If we can find a VGA working at 1013.3MHz, we might be able to apply the similar concept of the expended log detector on cavity filter amplifier. i.e. the gain is controlled with the log detector output, at hihger power input, the gain dropes more and at lower power the gain increases more. In this way, we can have larger dynamic range. The overall is a IF amplifer at 1013.3MHz but the BW is determined by the RBW filters.
> Lin
>
>
> --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
> >
> > How is the response at +21.4?
> >
> > Jim, W1JGH
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > I have now actually installed an amp in front of my cavity filter (ERA-33 attenuated down to 7 dB gain). I'm guessing the performance of this with the cavity filter will be similar to the performance of the SAW module with its internal amp.
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> > > I recalibrated, though my calibration is not extremely precise because I did it with my MSA upside down with the bottom off and the fan not running, so it was never at thermal equilibrium.
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very erratic graph. So I calibrated down to -128 dBm, but I don't expect much accuracy under -120 dBm.
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> > > In summary, I have a solid response from -120 dBm to 0 dBm, with at least 5 dB of lesser response added on to each end.
> > >
> > > Sam W.
> > >
> >
>

9027. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 14:47:07 UTC
From: Sam
Topic: 9018 Message: 9027

The cavity filter response is not changed by this arrangement, so if you have 100 dBc rejection at +21.4 MHz, and are viewing a signal of -20 dBm, you will see a -120 dBm ghost image. Reducing the minimum visible signal doesn't worsen the image, but makes it easier to see the image. With a -20 dBm signal you may also be creating low level harmonics, that also might become more visible with increased dynamic range.

When you reduce the low end, you will be able to see more, and some of what you see might be stuff you don't want to see.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> How is the response at +21.4?
>
> Jim, W1JGH
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > I have now actually installed an amp in front of my cavity filter (ERA-33 attenuated down to 7 dB gain). I'm guessing the performance of this with the cavity filter will be similar to the performance of the SAW module with its internal amp.
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> > On the high end, I was aiming for useable but not great response at 0 dBm. I get very strong response at -5 dBm and decent response at 0 dBm, and was able to calibrate to 6 dBm with the ADC values still increasing a useful amount.
> >
> > This is all in my 600 Hz RBW path. For wider paths, I lose a couple dB at the high end and varying amounts on the low end.
> >
> > In summary, I have a solid response from -120 dBm to 0 dBm, with at least 5 dB of lesser response added on to each end.
> >
> > Sam W.

> >
>

9028. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 15:21:20 UTC
From: Sam
Topic: 9018 Message: 9028

Lin,
Actually, you can let signals get to the VGA but not the log detector as long as the max gain of the VGA won't allow it to be overloaded by such stray signals. One way to make use of this would be to put a second VGA in front of the RBW filters. The IF2 amp might still be required, but with reduced gain--just enough to keep the noise level down. The second VGA could tie into the same control line as the first, and would have to have its gain limited to 20 dB or so to avoid the possibility of overload.

You could do the same thing at the cavity filter, but finding a reasonably low noise VGA that operates at >1 GHz, and has enough range not to be overloaded, may be a challenge.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Lin,
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> You actually could violate this rule for VNA use only, as long as there would never be a spurious signal strong enough to overload the VGA. That might be the case with a VGA located after the cavity filter (maybe even before the cavity) as long as the VGA never had gain greater than 30 dB or so. (The prime overload risk would come from leaked LO1.)
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> Sam W.
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> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
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> > Sam
> > If we can find a VGA working at 1013.3MHz, we might be able to apply the similar concept of the expended log detector on cavity filter amplifier. i.e. the gain is controlled with the log detector output, at hihger power input, the gain dropes more and at lower power the gain increases more. In this way, we can have larger dynamic range. The overall is a IF amplifer at 1013.3MHz but the BW is determined by the RBW filters.
> > Lin
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> > --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
> > >
> > > How is the response at +21.4?
> > >
> > > Jim, W1JGH
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> > > > I recalibrated, though my calibration is not extremely precise because I did it with my MSA upside down with the bottom off and the fan not running, so it was never at thermal equilibrium.
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> > > > My minimum visible signal with 600 kHz RBW is -122 dBm. My goal was to get a stable signal at -120 dBm. Such signal is now very visible, and if I place a marker on it, the value varies (noise) from scan to scan by about 2 dB. As far as I am concerned, that is excellent accuracy for such a low level signal. I can actually get a measurable response below -128 dBm, but if the ADC change per dB is too small, a small bit of noise creates a very erratic graph. So I calibrated down to -128 dBm, but I don't expect much accuracy under -120 dBm.
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> > > >
> > > > Sam W.
> > > >
> > >
> >
>

9029. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 15:56:05 UTC
From: inlinebeginner
Topic: 9018 Message: 9029

Sam
This is what I was calculating this morning. Here is what I got:
The MSA could have range: 0 dBm to -120dBm, with the following VGA config:

For 0dBm input: 3dB pad+ mixer1+ VGA1=10dB + cavity + mixer 2+ VGA2 =0dB + IFA2 + RBW. The log detector will see power around 0dBm.
For -120 dBm input: VGA1= 20dB, and VGA2=20dB.

To not overload the VGA1, we may put noise filter in front of VGA1 (worst case we can put two cavity filters).

The VGA may not be a real VGA, it could be a ERA-33+ Voltage controlled attenuator, if we can find one.

If we extend this concept, we can put a voltage controlled attenuator at Mixer1 input. That would extend the dynamic range to +20dBm to -120dBm.

Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Lin,
> Actually, you can let signals get to the VGA but not the log detector as long as the max gain of the VGA won't allow it to be overloaded by such stray signals. One way to make use of this would be to put a second VGA in front of the RBW filters. The IF2 amp might still be required, but with reduced gain--just enough to keep the noise level down. The second VGA could tie into the same control line as the first, and would have to have its gain limited to 20 dB or so to avoid the possibility of overload.
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> You could do the same thing at the cavity filter, but finding a reasonably low noise VGA that operates at >1 GHz, and has enough range not to be overloaded, may be a challenge.
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> > > --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
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> > > >
> > > > Jim, W1JGH
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> > > > > Sam W.
> > > > >

> > > >
> > >
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>

9030. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 17:01:56 UTC
From: Sam
Topic: 9018 Message: 9030

Lin,
I'm getting -120 dBm to 0 dBm now, with a fixed 7 dB amp rather than your VGA1.

If you have a regular need to view lower signals, I think the way to go is to increase the amp gain and use a "manually-controlled attenuator"--i.e insert one when necessary to see high level signals.
If you rarely need the low levels, you can leave the internal amp at 7 dB, or even leave it out, but add an external amp when necessary.

There is a little-known feature of the software called Front End Compensation, where you can specify a front end that you have added (such as an amp or attenuator) and it will use a calibration file to adjust the readings. You can use the MSA to create the calibration file. This is only needed for SA mode, since in VNA modes the regular operating calibration takes care of the front end.

Adding attenuators or amps to the input is a way of shifting but not increasing the "simultaneous dynamic range". But it seems to me that if you get that range to 120 dB, the ability to shift it up or down with an attenuator or amp is all you are likely to need. If you have a 20 dB amp for getting to low signals, and a 20 dB attenuator (or maybe a couple), you'll be able to reach everything you want to reach.

One might even say that the pre-cavity amp is not all that necessary. I was just compulsive about getting a solid -120 to 0 dB range. Plus, I wanted to get an idea what type of range I would get with the SAW module, which I expect will come out in the ballpark of what I get with the pre-cavity amp.

Sam W.

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>
> To not overload the VGA1, we may put noise filter in front of VGA1 (worst case we can put two cavity filters).
>
> The VGA may not be a real VGA, it could be a ERA-33+ Voltage controlled attenuator, if we can find one.
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> If we extend this concept, we can put a voltage controlled attenuator at Mixer1 input. That would extend the dynamic range to +20dBm to -120dBm.

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> > > >
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> > > > > > Sam W.
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>

9031. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 18:13:24 UTC
From: inlinebeginner
Topic: 9018 Message: 9031

Sam
My calculation is very conservitive. The -120dBm input is map to the linear area -90dBm of log detector, and the noise floor of log detector is around -100dBm. i.e. the 120dBm is very decent measurement. If we just want to identify the signal above the noise floor, the calculated signal leve at MSA input should be around -128 dBm. Also, I use 1kHz RBW filter in my calculation, not 600Hz, the log detector is also the original Scotty's log detector, not the expended log detector. Your expended log detector actually contains one VGA already.
Here is how I calculated: The overall NF=16dB, overall gain 29. The noise floor at log detector input: -174 +16 + 29 + 30 = -99dBm. Log detector minimum input level is around -99dBm, at that area is very non-linear. However, starting from -91dBm to +15dBm, log detector has very good linearity, therefore, if we map -91dBm back to MSA input with the 29dB gain, the signal level will be -91-29=-120dBm. That does not say if we input -128dBm the log detecto won't reponse. becasue if we input -128 at MSA input, with the 29dB gain, the signal will show up at log detector as -99dBm, which is within log detector response range.

Lin

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> Lin,
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> If you have a regular need to view lower signals, I think the way to go is to increase the amp gain and use a "manually-controlled attenuator"--i.e insert one when necessary to see high level signals.
> If you rarely need the low levels, you can leave the internal amp at 7 dB, or even leave it out, but add an external amp when necessary.
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9032. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 19:06:27 UTC
From: Sam
Topic: 9018 Message: 9032

It can all work as long as you don't overload anything along the way. A VGA immediately before or after the cavity filter would have to be able to handle inputs of at least -15 or -20 dBm along with the desired signal without becoming saturated in order to work well in SA mode. And have low noise. As a practical matter, I suspect you would need a small fixed gain low-noise amp followed by a VGA in order to minimize the effects of VGA noise.

The expanded log detector was intended to be linear-in-db over as broad a range as possible, but because of our path calibration this linearity is not actually critical for the MSA. Any voltage-controlled mechanism would work that has high gain at low inputs and drops the gain at higher inputs, as long as the drop is not so abrupt as to require calibration at fine intervals. If would even be fine for the gain to hit its minimum at fairly low input levels, such as -90 dBm. Something as simple as a PIN diode attenuator could work, if it has reasonable temperature stability.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
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> Sam
> My calculation is very conservitive. The -120dBm input is map to the linear area -90dBm of log detector, and the noise floor of log detector is around -100dBm. i.e. the 120dBm is very decent measurement. If we just want to identify the signal above the noise floor, the calculated signal leve at MSA input should be around -128 dBm. Also, I use 1kHz RBW filter in my calculation, not 600Hz, the log detector is also the original Scotty's log detector, not the expended log detector. Your expended log detector actually contains one VGA already.
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9033. Re: [spectrumanalyzer] Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 20:43:56 UTC
From: Jurgen
Topic: 9018 Message: 9033

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Quote:
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That is more than shifting the sensitivity range, looks to me you are expanding the range?!
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Jurgen

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9034. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 21:20:20 UTC
From: inlinebeginner
Topic: 9018 Message: 9034

Jurgen
With a fixed gain amplifier, we can only shift the log detector range up and down, but we can not expend the range.
With VGA, we can not only shift the log detector range, but also expend the range. The reason it can expend the range is that it provides a variable gain according to the log detector output nearlly linearly. At lowe input power end, it provide max gain, and at high power end it provide min gain. If the input power is in between, the gain will be interpolated almost linearly. That is how Sam's expended log detector works, and we try to expend this concept from 10.7MHz IF2 signal to 1013.3MHz IF1 signal or even to the input of the MSA.
Lin

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
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9035. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 21:37:57 UTC
From: Sam
Topic: 9018 Message: 9035

It does sort of expand the range, by shifting it down so the range available at 5+ dBm, which is not very useable anyway, becomes useable.

The apparent range of the expanded log detector, or the regular log detector for that matter, gets extended when used in the MSA for two reasons. First, noise at the low end causes the response to flatten out, so a 1 dB change at the MSA input will cause less than that change at the VGA input. Second, the increasing insertion loss of Mixer 1 at the high end causes a similar effect for high end signals.

Also, if I recall correctly, your -3 dBm upper limit has to do with the VGA saturating. You can actually operate a ways into saturation as long as the VGA output keeps increasing with increasing input.
Sam W.

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9036. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 21:43:43 UTC
From: inlinebeginner
Topic: 9018 Message: 9036

As we only working at 1013.3MHz, it may not be a difficult work to construct a PIN attenuator. Or can find a product:
http://www.rflambda.com/pdf/voltageattenuator/RFVAT0102A30.pdf

DIY tutorial:
http://palgong.kyungpook.ac.kr/~ysyoon/Pdf/an1048.pdf
http://www.odyseus.nildram.co.uk/RFMicrowave_Circuits_Files/Attenuator.pdf

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9037. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 22:06:25 UTC
From: inlinebeginner
Topic: 9018 Message: 9037

with a OPAM inverter, HSMP-3866 may work.
http://www.avagotech.com/docs/AV02-1962EN
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> > > > > > > > > > > > My minimum visible signal with 600 kHz RBW is -122 dBm. My goal was to get a stable signal at -120 dBm. Such signal is now very visible, and if I place a marker on it, the value varies (noise) from scan to scan by about 2 dB. As far as I am concerned, that is excellent accuracy for such a low level signal. I can actually get a measurable response below -128 dBm, but if the ADC change per dB is too small, a small bit of noise creates a very erratic graph. So I calibrated down to -128 dBm, but I don't expect much accuracy under -120 dBm.
> > > > > > > > >
> > > > > > > > > > > > On the high end, I was aiming for useable but not great response at 0 dBm. I get very strong response at -5 dBm and decent response at 0 dBm, and was able to calibrate to 6 dBm with the ADC values still increasing a useful amount.
> > > > > > > > >
> > > > > > > > > > > > This is all in my 600 Hz RBW path. For wider paths, I lose a couple dB at the high end and varying amounts on the low end.
> > > > > > > > >
> > > > > > > > > > > > In summary, I have a solid response from -120 dBm to 0 dBm, with at least 5 dB of lesser response added on to each end.
> > > > > > > > >
> > > > > > > > > > > > Sam W.
> > > > > > > > >
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9038. Zero Response and Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 22:07:46 UTC
From: Sam
Topic: 9038 Message: 9038

Now that I have improved the lower limit for my MSA, I decided to repeat the graph of my zero response, which can now be seen hitting -128 dBm at 500 kHz. Photo is in the SamW photo album. This also demonstrates how you can get useful info in VNA mode well below the level of the "minimum visible signal" in SA mode. Had I thought of this earlier, I would have done this with the 30 dB amp when I had that in place. But that would also require recalibrating, which I don't feel like doing.

I also did a scan for the LO1 leakage spurs that arise from LO1 leaking through Mixer 1 and the cavity filter and reaching Mixer 2. That photo is also in the SamW album. I have a bunch of such spurs, but none is above -100 dBm. I suspect some of these actually arise from leakage of LO1 harmonics, which I plan to try to filter out.

Sam W.

9039. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 22:26:03 UTC
From: Sam
Topic: 9018 Message: 9039

Jurgen,
Also, I looked at my original test documentation for my expanded log detector and I got very solid response from -115 dBm to +5 dBm, when tested freestanding with a signal generator. Some time ago we did some experimentation with yours, but I think we need to compare yours with the original schematic.

Also, last I knew you had the experimental noise filter with an op amp in it, which turned out not to be such a great idea (my fault).

But I wouldn't worry about it until everything else is satisfactory, as even the numbers you quote will provide a good range inside the MSA due to the factors I mentioned.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> It does sort of expand the range, by shifting it down so the range available at 5+ dBm, which is not very useable anyway, becomes useable.
>
> The apparent range of the expanded log detector, or the regular log detector for that matter, gets extended when used in the MSA for two reasons. First, noise at the low end causes the response to flatten out, so a 1 dB change at the MSA input will cause less than that change at the VGA input. Second, the increasing insertion loss of Mixer 1 at the high end causes a similar effect for high end signals.
>
> Also, if I recall correctly, your -3 dBm upper limit has to do with the VGA saturating. You can actually operate a ways into saturation as long as the VGA output keeps increasing with increasing input.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@> wrote:
> >
> > Sam,
> > Quote:
> > One might even say that the pre-cavity amp is not all that necessary. I
> > was just compulsive about getting a solid -120 to 0 dB range. Plus, I
> > wanted to get an idea what type of range I would get with the SAW
> > module, which I expect will come out in the ballpark of what I get with
> > the pre-cavity amp.
> >
> > That is more than shifting the sensitivity range, looks to me you are
> > expanding the range?!
> > In my testing the Expanded Lg Amp by itself could only get from -3 to -105.
> >
> > Jurgen
> >

> >
> >
> > On 12/19/2011 12:01 PM, Sam wrote:
> > >
> > > Lin,
> > > I'm getting -120 dBm to 0 dBm now, with a fixed 7 dB amp rather than
> > > your VGA1.
> > >
> > > If you have a regular need to view lower signals, I think the way to
> > > go is to increase the amp gain and use a "manually-controlled
> > > attenuator"--i.e insert one when necessary to see high level signals.
> > > If you rarely need the low levels, you can leave the internal amp at 7
> > > dB, or even leave it out, but add an external amp when necessary.
> > >
> > > There is a little-known feature of the software called Front End
> > > Compensation, where you can specify a front end that you have added
> > > (such as an amp or attenuator) and it will use a calibration file to
> > > adjust the readings. You can use the MSA to create the calibration
> > > file. This is only needed for SA mode, since in VNA modes the regular
> > > operating calibration takes care of the front end.
> > >
> > > Adding attenuators or amps to the input is a way of shifting but not
> > > increasing the "simultaneous dynamic range". But it seems to me that
> > > if you get that range to 120 dB, the ability to shift it up or down
> > > with an attenuator or amp is all you are likely to need. If you have a
> > > 20 dB amp for getting to low signals, and a 20 dB attenuator (or maybe
> > > a couple), you'll be able to reach everything you want to reach.
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> > > One might even say that the pre-cavity amp is not all that necessary.
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> > > I wanted to get an idea what type of range I would get with the SAW
> > > module, which I expect will come out in the ballpark of what I get
> > > with the pre-cavity amp.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com
> > > <mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner"
> > > <inlinebeginner@> wrote:
> > > >
> > > > Sam
> > > > This is what I was calculating this morning. Here is what I got:
> > > > The MSA could have range: 0 dBm to -120dBm, with the following VGA
> > > config:
> > > >
> > > > For 0dBm input: 3dB pad+ mixer1+ VGA1=10dB + cavity + mixer 2+ VGA2
> > > =0dB + IFA2 + RBW. The log detector will see power around 0dBm.
> > > > For -120 dBm input: VGA1= 20dB, and VGA2=20dB.
> > > >
> > > > To not overload the VGA1, we may put noise filter in front of VGA1

> > > (worst case we can put two cavity filters).
> > > >
> > > > The VGA may not be a real VGA, it could be a ERA-33+ Voltage
> > > controlled attenuator, if we can find one.
> > > >
> > > > If we extend this concept, we can put a voltage controlled
> > > attenuator at Mixer1 input. That would extend the dynamic range to
> > > +20dBm to -120dBm.
> > > >
> > > > Lin
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com
> > > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
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> > > > > Lin,
> > > > > Actually, you can let signals get to the VGA but not the log
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> > > noise level down. The second VGA could tie into the same control line
> > > as the first, and would have to have its gain limited to 20 dB or so
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> > > > > You could do the same thing at the cavity filter, but finding a
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> > > not to be overloaded, may be a challenge.
> > > > >
> > > > > Sam W.
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> > > > > --- In spectrumanalyzer@yahoogroups.com
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> > > > > > Lin,
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> > > the log detector. Otherwise, a strong signal can overload the VGA
> > > without the log detector knowing about it. That is the reason I use
> > > the arrangement RBW Filters->VGA->Noise Filter->log detector, with the
> > > Noise Filter always broader bandwidth than the RBW filter.
> > > > > >
> > > > > > You actually could violate this rule for VNA use only, as long
> > > as there would never be a spurious signal strong enough to overload
> > > the VGA. That might be the case with a VGA located after the cavity
> > > filter (maybe even before the cavity) as long as the VGA never had
> > > gain greater than 30 dB or so. (The prime overload risk would come
> > > from leaked LO1.)
> > > > > >
> > > > > > Sam W.
> > > > > >

> > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > <mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner"
> > > <inlinebeginner@> wrote:
> > > > > > >
> > > > > > > > Sam
> > > > > > > > If we can find a VGA working at 1013.3MHz, we might be able to
> > > apply the similar concept of the expended log detector on cavity
> > > filter amplifier. i.e. the gain is controlled with the log detector
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> > > the gain increases more. In this way, we can have larger dynamic
> > > range. The overall is a IF amplifer at 1013.3MHz but the BW is
> > > determined by the RBW filters.
> > > > > > > > Lin
> > > > > > > >
> > > > > > > >
> > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > <mailto:spectrumanalyzer%40yahoogroups.com>, "jghbeta" <jghalpha@> wrote:
> > > > > > > > >
> > > > > > > > > How is the response at +21.4?
> > > > > > > > >
> > > > > > > > > Jim, W1JGH
> > > > > > > > >
> > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
> > > > > > > > >
> > > > > > > > > I have now actually installed an amp in front of my cavity
> > > filter (ERA-33 attenuated down to 7 dB gain). I'm guessing the
> > > performance of this with the cavity filter will be similar to the
> > > performance of the SAW module with its internal amp.
> > > > > > > > >
> > > > > > > > > I recalibrated, though my calibration is not extremely
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> > > > > > > > >
> > > > > > > > > This is all in my 600 Hz RBW path. For wider paths, I lose

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> > > > > > > > > > Sam W.
> > > > > > > > > >
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9040. Re: Zero Response and Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 22:32:26 UTC
From: inlinebeginner
Topic: 9038 Message: 9040

A buffer amplifier between LO1 and mixer4 would helpful. i.e. we need two buffer amplifers, one to isolate LO2 and one to isolate LO1.
A while ago, I putlished some photo here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/2017591641/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc

by adding one more buffer amplifier between LO1 and mixer 4, it fixed the problem.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Now that I have improved the lower limit for my MSA, I decided to repeat the graph of my zero response, which can now be seen hitting -128 dBm at 500 kHz. Photo is in the SamW photo album. This also demonstrates how you can get useful info in VNA mode well below the level of the "minimum visible signal" in SA mode. Had I thought of this earlier, I would have done this with the 30 dB amp when I had that in place. But that would also require recalibrating, which I don't feel like doing.
>
> I also did a scan for the LO1 leakage spurs that arise from LO1 leaking through Mixer 1 and the cavity filter and reaching Mixer 2. That photo is also in the SamW album. I have a bunch of such spurs, but none is above -100 dBm. I suspect some of these actually arise from leakage of LO1 harmonics, which I plan to try to filter out.
>
> Sam W.
>

9041. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-19 23:19:09 UTC
From: Sam
Topic: 9018 Message: 9041

Lin,
Not bad for $1.71. That would work well if you used it preceding a 20-30 dB amp and could manipulate the control voltage (derived from the log detector output) so that it would be somewhere between 2.5 and 5 V when the MSA input signals are weak and a very steady value somewhere between 0.5 V and 1 V when the input reaches a level where no amplification is needed any more.

The attenuation curve has a bit of wiggle, but if the attenuation became fixed above a certain input level, any error caused by the wiggle would not mean much since it would only affect low level signals (-105 dBm vs. -105.3 dBm is no big deal), or you could simply calibrate at small intervals.

They don't show the effect of temperature on attenuation but they do show the effect on individual diode resistance. It seems reasonably small, especially if you are at normal room temperature or above, as the inside of the MSA would normally be.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> with a OPAM inverter, HSMP-3866 may work.
> http://www.avagotech.com/docs/AV02-1962EN
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > As we only working at 1013.3MHz, it may not be a difficult work to construct a PIN attenuator. Or can find a product:
> > http://www.rflambda.com/pdf/voltageattenuator/RFVAT0102A30.pdf
> >
> > DIY tutorial:
> > http://palgong.kyungpook.ac.kr/~ysyoon/Pdf/an1048.pdf
> > http://www.odyseus.nildram.co.uk/RFMicrowave_Circuits_Files/Attenuator.pdf
> >
> > Lin
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > It can all work as long as you don't overload anything along the way. A VGA immediately before or after the cavity filter would have to be able to handle inputs of at least -15 or -20 dBm along with the desired signal without becoming saturated in order to work well in SA mode. And have low noise. As a practical matter, I suspect you would need a small fixed gain low-noise amp followed by a VGA in order to minimize the effects of VGA noise.
> > >
> > > The expanded log detector was intended to be linear-in-db over as broad a range as possible, but because of our path calibration this linearity is not actually critical for

the MSA. Any voltage-controlled mechanism would work that has high gain at low inputs and drops the gain at higher inputs, as long as the drop is not so abrupt as to require calibration at fine intervals. If would even be fine for the gain to hit its minimum at fairly low input levels, such as -90 dBm. Something as simple as a PIN diode attenuator could work, if it has reasonable temperature stability.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > >
> > > > Sam
> > > > My calculation is very conservitive. The -120dBm input is map to the linear area -90dBm of log detector, and the noise floor of log detector is around -100dBm. i.e. the 120dBm is very decent measurement. If we just want to identify the signal above the noise floor, the calculated signal leve at MSA input should be around -128 dBm. Also, I use 1kHz RBW filter in my calculation, not 600Hz, the log detector is also the original Scotty's log detector, not the expended log detector. Your expended log detector actually contains one VGA already.
> > > > Here is how I calculated: The overall NF=16dB, overall gain 29. The noise floor at log detector input: -174 +16 + 29 + 30 = -99dBm. Log detector minimum input level is around -99dBm, at that area is very non-linear. However, starting from -91dBm to +15dBm, log detector has very good linearity, therefore, if we map -91dBm back to MSA input with the 29dB gain, the signal level will be -91-29=-120dBm. That does not say if we input -128dBm the log detecto won't reponse. becasue if we input -128 at MSA input, with the 29dB gain, the signal will show up at log detector as -99dBm, which is within log detector response range.
> > > >
> > > > Lin
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > >
> > > > > Lin,
> > > > > I'm getting -120 dBm to 0 dBm now, with a fixed 7 dB amp rather than your VGA1.
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> > > > > If you have a regular need to view lower signals, I think the way to go is to increase the amp gain and use a "manually-controlled attenuator"--i.e insert one when necessary to see high level signals.
> > > > > If you rarely need the low levels, you can leave the internal amp at 7 dB, or even leave it out, but add an external amp when necessary.
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> > > > > There is a little-known feature of the software called Front End Compensation, where you can specify a front end that you have added (such as an amp or attenuator) and it will use a calibration file to adjust the readings. You can use the MSA to create the calibration file. This is only needed for SA mode, since in VNA modes the regular operating calibration takes care of the front end.
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> > > > > Adding attenuators or amps to the input is a way of shifting but not increasing the "simultaneous dynamic range". But it seems to me that if you get that range to 120 dB, the ability to shift it up or down with an attenuator or amp is all you are likely to need. If you have a 20 dB amp for getting to low signals, and a 20 dB attenuator (or maybe a couple), you'll be able to reach everything you want to reach.

> > > > >
> > > > > One might even say that the pre-cavity amp is not all that necessary. I was just compulsive about getting a solid -120 to 0 dB range. Plus, I wanted to get an idea what type of range I would get with the SAW module, which I expect will come out in the ballpark of what I get with the pre-cavity amp.
> > > > >
> > > > > Sam W.
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> > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
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> > > > > > Sam
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> > > > > > The MSA could have range: 0 dBm to -120dBm, with the following VGA config:
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> > > > > > For 0dBm input: 3dB pad+ mixer1+ VGA1=10dB + cavity + mixer 2+ VGA2 =0dB + IFA2 + RBW. The log detector will see power around 0dBm.
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> > > > > > If we extend this concept, we can put a voltage controlled attenuator at Mixer1 input. That would extend the dynamic range to +20dBm to -120dBm.
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> > > > > > Lin
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> > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
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> > > > > > > > > > > How is the response at +21.4?
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> >
>

9042. Re: Cavity filter construction (Len's soldering hints and secrets)

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 00:04:52 UTC
From: jghbeta
Topic: 9005 Message: 9042

Len,
Could you build a 5 cavity filter (instead of four).

Jim, W1JGH

--- In spectrumanalyzer@yahoogroups.com, "Len" <redmond2@...> wrote:
>
> Hello Group
>
>
>
> At the moment I am building MSA coax filters serial numbers 31 to 45,
> including 3 kits
>
>
>
> From the official Wiki Leaks:
>
> >>>>>>>>>>>>>>>
>
> (1) Top and bottom plates are 1mm copper or 25 thou or 1/40" or gauge xxx
>
> The pipes are so stiff a thinner "flexible" top and base plate is actually
> good not bad.
>
>
>
> (2) The first soldering/brazing step is to use plumber's Silver 15% rods to
> braze the 4 tubes together.
>
> Of course the Pipes are already machined to size with hairpin loop holes in
> them .
>
> Brazing temperature is well over >> 1000F, >>700C with a MAPGAS flame.
>
>
>
> (3) There is a jig for clamping them all together while this happens.
>
> A single steel rod through all the hairpin holes lines all the pipes up
> nicely and keeps the holes open.
>
>
>
> (4) The copper is now all black, clean them by soaking them alternatively

> in Vinegar and or de-scaling agent.
>
> Then polish them back up with emery cloth wet and dry sanding paper.
>
>
>
> The brazing exercise is the key.
>
> The pipe assembly is now proof against excess soldering heat and other
> timing disasters.
>
> Further soldering on the bottom, top, sides can never ever loosen the
> pipes or expose the coupling holes!!
>
> >>>>>>>>>>>
>
>
>
> Happy to sell just the 4 machined pipes brazed together with all hairpin
> loops holes and polished.
>
>
>
> Price U$ 28 plus approx U$ 20 post from Perth Australia to the rest of the
> world.
>
> The post cost is high, Perth WA is roughly on the opposite side of the world
> to New York.
>
>
>
> See also my photos and kit instruction notes in my group files or e-mail me
> and I will send it.
>
>
>
> Regards
>
> Len Spyker
>

9043. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 00:20:19 UTC
From: jghbeta
Topic: 9018 Message: 9043

Sam,
I have been following closely this discussion, to the point that I am considering a 5 cavity filter (instead of 4). Since the amplifier is to provide about 10 dB gain, I am looking at the MiniCircuts low noise coaxials like the ZRL-1150LN (NF=0.8), and specially the ZX60-1215LN (NF=0.4). What do you think?

Jim, W1JGH

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have now actually installed an amp in front of my cavity filter (ERA-33 attenuated down to 7 dB gain). I'm guessing the performance of this with the cavity filter will be similar to the performance of the SAW module with its internal amp.
>
> I recalibrated, though my calibration is not extremely precise because I did it with my MSA upside down with the bottom off and the fan not running, so it was never at thermal equilibrium.
>
> My minimum visible signal with 600 kHz RBW is -122 dBm. My goal was to get a stable signal at -120 dBm. Such signal is now very visible, and if I place a marker on it, the value varies (noise) from scan to scan by about 2 dB. As far as I am concerned, that is excellent accuracy for such a low level signal. I can actually get a measurable response below -128 dBm, but if the ADC change per dB is too small, a small bit of noise creates a very erratic graph. So I calibrated down to -128 dBm, but I don't expect much accuracy under -120 dBm.
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> On the high end, I was aiming for useable but not great response at 0 dBm. I get very strong response at -5 dBm and decent response at 0 dBm, and was able to calibrate to 6 dBm with the ADC values still increasing a useful amount.
>
> This is all in my 600 Hz RBW path. For wider paths, I lose a couple dB at the high end and varying amounts on the low end.
>
> In summary, I have a solid response from -120 dBm to 0 dBm, with at least 5 dB of lesser response added on to each end.
>
> Sam W.
>

9044. Re: Zero Response and Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 00:24:51 UTC
From: Sam
Topic: 9038 Message: 9044

The LO2 isolation amp eliminated a broad range of leakage that seriously interfered with the usability of the MSA below 1 MHz, being more problematic the lower you went. If the spur at the RBW frequency bothers you, the additional amp for LO1 isolation might make sense, but if it only improves performance at one frequency, many people might not consider it worth the trouble.

I have found that for VNA use, if you use a narrow RBW, it is just random bad luck if you happen to run into one of the spurs, which aren't all that numerous. For SA use, if you try to densely cover a range that covers part of the 5-17 MHz range, you will likely run into a few spurs, and you can run into some outside that area, but if you know where the spurs are, they aren't all that bothersome, unless you happen to have some very strong ones.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> A buffer amplifier between LO1 and mixer4 would helpful. i.e. we need two buffer amplifers, one to isolate LO2 and one to isolate LO1.
> A while ago, I putlished some photo here:
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/2017591641/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
>
> by adding one more buffer amplifier between LO1 and mixer 4, it fixed the problem.
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Now that I have improved the lower limit for my MSA, I decided to repeat the graph of my zero response, which can now be seen hitting -128 dBm at 500 kHz. Photo is in the SamW photo album. This also demonstrates how you can get useful info in VNA mode well below the level of the "minimum visible signal" in SA mode. Had I thought of this earlier, I would have done this with the 30 dB amp when I had that in place. But that would also require recalibrating, which I don't feel like doing.
> >
> > I also did a scan for the LO1 leakage spurs that arise from LO1 leaking through Mixer 1 and the cavity filter and reaching Mixer 2. That photo is also in the SamW album. I have a bunch of such spurs, but none is above -100 dBm. I suspect some of these actually arise from leakage of LO1 harmonics, which I plan to try to filter out.
> >
> > Sam W.
> >
>

9045. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 00:39:16 UTC
From: Sam
Topic: 9018 Message: 9045

As far as the amp is concerned, it's a matter of taste, but I'm not sure it is worth great expense to lower the noise figure by a few dB. In fact, someone can correct me if I am wrong, but I think that if you have an amp with 7 dB gain (my actual value) followed by a cavity filter and Mixer 2 each with 6-7 db of loss, if the amp creates 3 dB of noise (re: input), that noise will itself be buried in resistor noise when it reaches the IF2 amp and be almost irrelevant.

As far as a 5-holer, that only makes sense if a tiny image frequency bothers you, or if creates an issue when a strong signal raises the overall "noise floor" due to limited "ultimate attenuation". By the way, if you already have a 4-holer, there is no reason you can't cascade it with a 1-holer. You don't have to start from scratch. In fact, you might consider doing 1-holer->amp->4-holer.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@...> wrote:
>
> Sam,
> I have been following closely this discussion, to the point that I am considering a 5 cavity filter (instead of 4). Since the amplifier is to provide about 10 dB gain, I am looking at the MiniCircuts low noise coaxials like the ZRL-1150LN (NF=0.8), and specially the ZX60-1215LN (NF=0.4). What do you think?
>
> Jim, W1JGH
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > I have now actually installed an amp in front of my cavity filter (ERA-33 attenuated down to 7 dB gain). I'm guessing the performance of this with the cavity filter will be similar to the performance of the SAW module with its internal amp.
> >
> > I recalibrated, though my calibration is not extremely precise because I did it with my MSA upside down with the bottom off and the fan not running, so it was never at thermal equilibrium.
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> > My minimum visible signal with 600 kHz RBW is -122 dBm. My goal was to get a stable signal at -120 dBm. Such signal is now very visible, and if I place a marker on it, the value varies (noise) from scan to scan by about 2 dB. As far as I am concerned, that is excellent accuracy for such a low level signal. I can actually get a measurable response below -128 dBm, but if the ADC change per dB is too small, a small bit of noise creates a very erratic graph. So I calibrated down to -128 dBm, but I don't expect much accuracy under -120 dBm.
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> > On the high end, I was aiming for useable but not great response at 0 dBm. I get very strong response at -5 dBm and decent response at 0 dBm, and was able to calibrate to 6 dBm with the ADC values still increasing a useful amount.

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> > This is all in my 600 Hz RBW path. For wider paths, I lose a couple dB at the high end and varying amounts on the low end.
> >
> > In summary, I have a solid response from -120 dBm to 0 dBm, with at least 5 dB of lesser response added on to each end.
> >
> > Sam W.
> >
>

9047. Incoherent Averaging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 01:18:07 UTC
From: nealmartini
Topic: 9047 Message: 9047

Sam,

Have you ever tried to implement an averaging capability in the MSA software? I know the MSA output spectra have no phase syncronization, but averaging would definitely reduce the power spectrum's noise variance, which would help especially at the low levels your currently discussing.

Neal

9048. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 01:29:04 UTC
From: inlinebeginner
Topic: 9018 Message: 9048

I agree with Sam. 0.4dB may not have significant difference from 3.3dB for this applicaton. 1 holer + amp + 4 holer cavity might be the way we want to go. The SAW may have similar structure, SAW1 + amp + SAW2 + SAW3. As we could not get the SAW parts, the cavity filter experiment is the closest emulation. It may also benifit to those who do not want to change to SAW. If we use SAW, I hope we can get the part easily, it it too hard to find the SAW, cavity will still the traditional way to build the MSA.
For the SAW filter source, it really up to the quantity that we can order. If we can order 100K (this is a small number, if this filter is used in a mass product), I think the vendor would be really happy to provde them. If we only order 100, the vendor may not willing accept such a small order if there is no such part in stock, because the cost to reopen the production line may be much hgiher than what we paid to the vendor. On the other side, cavity filter is a home made filter, as long as you spend enough time and are patient enough, you should have one (maybe Len can sell one to you). It is controlled by yourself.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> As far as the amp is concerned, it's a matter of taste, but I'm not sure it is worth great expense to lower the noise figure by a few dB. In fact, someone can correct me if I am wrong, but I think that if you have an amp with 7 dB gain (my actual value) followed by a cavity filter and Mixer 2 each with 6-7 db of loss, if the amp creates 3 dB of noise (re: input), that noise will itself be buried in resistor noise when it reaches the IF2 amp and be almost irrelevant.
>
> As far as a 5-holer, that only makes sense if a tiny image frequency bothers you, or if creates an issue when a strong signal raises the overall "noise floor" due to limited "ultimate attenuation". By the way, if you already have a 4-holer, there is no reason you can't cascade it with a 1-holer. You don't have to start from scratch. In fact, you might consider doing 1-holer->amp->4-holer.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
> >
> > Sam,
> > I have been following closely this discussion, to the point that I am considering a 5 cavity filter (instead of 4). Since the amplifier is to provide about 10 dB gain, I am looking at the MiniCircuts low noise coaxials like the ZRL-1150LN (NF=0.8), and specially the ZX60-1215LN (NF=0.4). What do you think?
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> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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down to 7 dB gain). I'm guessing the performance of this with the cavity filter will be similar to the performance of the SAW module with its internal amp.
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> > > In summary, I have a solid response from -120 dBm to 0 dBm, with at least 5 dB of lesser response added on to each end.
> > >
> > > Sam W.
> > >
> >
>

9049. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 01:41:12 UTC
From: jghbeta
Topic: 9018 Message: 9049

I am measuring 2.8 dB insertion loss at the diplexer 1G band, where there is just a 33pF cap. Does this match with what you have?
Jim, W1JGH

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> As far as the amp is concerned, it's a matter of taste, but I'm not sure it is worth great expense to lower the noise figure by a few dB. In fact, someone can correct me if I am wrong, but I think that if you have an amp with 7 dB gain (my actual value) followed by a cavity filter and Mixer 2 each with 6-7 db of loss, if the amp creates 3 dB of noise (re: input), that noise will itself be buried in resistor noise when it reaches the IF2 amp and be almost irrelevant.
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> Sam W.
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> > >
> > > Sam W.
> > >
> >
>

9050. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 02:27:09 UTC
From: jghbeta
Topic: 9018 Message: 9050

My policy has always been not to go with a sng;le supplier item. I haven't seen a 1013 saw anywere else, it may be just a fluke. I will play with the saw but I am staying with the cavities.

Jim

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> I agree with Sam. 0.4dB may not have significant difference from 3.3dB for this applicaton. 1 holer + amp + 4 holer cavity might be the way we want to go. The SAW may have similar structure, SAW1 + amp + SAW2 + SAW3. As we could not get the SAW parts, the cavity filter experiment is the closest emulation. It may also benifit to those who do not want to change to SAW. If we use SAW, I hope we can get the part easily, it it too hard to find the SAW, cavity will still the traditional way to build the MSA.
> For the SAW filter source, it really up to the quantity that we can order. If we can order 100K (this is a small number, if this filter is used in a mass product), I think the vendor would be really happy to provde them. If we only order 100, the vendor may not willing accept such a small order if there is no such part in stock, because the cost to reopen the production line may be much hgiher than what we paid to the vendor. On the other side, cavity filter is a home made filter, as long as you spend enough time and are patient enough, you should have one (maybe Len can sell one to you). It is controlled by yourself.
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> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
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> > > >
> > > > Sam W.
> > > >
> > >
> >
>

9051. SAW Testing

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 05:09:45 UTC
From: william
Topic: 9051 Message: 9051

Hi All,
I just updated the web page:
http://scottyspectrumanalyzer.com/slim_sfa_1013.html
with more results. I played with the SAW/Amplifier section but have not yet installed the amplifier or the 3 dB input attenuator. I wanted to get a few more characterizations before I did that. You can consider this section of the web page as looking over my shoulder as I play.
Scotty

9052. Re: [spectrumanalyzer] Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 05:12:41 UTC
From: Neal
Topic: 9018 Message: 9052

I already have a quote for an order of 325 SAWs. There was no hesitation on the supplier's part. I understand the issue of single sourcing, but my experience tells me that this is only a short term issue. The size and performance of the SAWs employed in the 1013 MHz filter are very compelling. That historically drives other similar applications that will drive similar SAW product developments and other manufacturers will jump in.

The order window for the group buy closes this Thursday. At that point I will be sending out the details to finalize the group buy. BTW, I have orders for 114 sets of parts for filters so far.

Neal

From: inlinebeginner
Sent: Monday, December 19, 2011 5:29 PM
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Re: Pre-Cavity Amp

I agree with Sam. 0.4dB may not have significant difference from 3.3dB for this applicaton. 1 holer + amp + 4 holer cavity might be the way we want to go. The SAW may have similar structure, SAW1 + amp + SAW2 + SAW3. As we could not get the SAW parts, the cavity filter experiment is the closest emulation. It may also benifit to those who do not want to change to SAW. If we use SAW, I hope we can get the part easily, it it too hard to find the SAW, cavity will still the traditional way to build the MSA.
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--- In mailto:spectrumanalyzer%40yahoogroups.com, "Sam" <swetterlin@...> wrote:
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> Sam W.
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> >
>

9053. Re: Cavity filter construction (Len's soldering hints and secrets) 5 CAVITIES

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 07:52:00 UTC
From: Len
Topic: 9053 Message: 9053

Re: Can I build five cavity filter?

I can do it, but ,maybe best to first ask our guru Scotty if he foresees any downs or even if there are any ups at all.

I would expect more attenuation another -2-3 db and perhaps steeper- complex phase shifts, ripples?

I was contemplating building a 1x and 2x filter for possible SAW projects.

So I could couple a current 4x and 1x proto and suck it and see.

I have qty 20 raw cut pipes and posts (spare) at the moment so no problem there.

Price of current 4x cavity = U$80 assembled and tested, so 5x cavity = U$100.

Postage for a 5x or 4x+1x may be a big price step the 4 x is 0.495 Kg just inside the OZ post office < 0.5Kg cheaper rate.

Regards

Len Spyker

9054. RE: [spectrumanalyzer] Re: Cavity filter construction (Len's soldering hints and secrets) 5 CAVITIES

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 09:30:58 UTC
From: F4CNY
Topic: 9053 Message: 9054

Hi Len,

I will be interested by a 5x cavity.
Payment by paypal, possible ?
Thanks.
Regrads,
Ennio
-----Message d'origine-----
De : spectrumanalyzer@yahoogroups.com
[mailto:spectrumanalyzer@yahoogroups.com]De la part de Len
Envoye : mardi 20 decembre 2011 08:52
A : spectrumanalyzer@yahoogroups.com
Objet : [spectrumanalyzer] Re: Cavity filter construction (Len's soldering hints and secrets) 5 CAVITIES
Importance : Haute

Re: Can I build five cavity filter?

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Regards

Len Spyker

9055. Amp Group buy, any more takers

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 11:57:28 UTC
From: s.staines@cranfield.ac.uk
Topic: 9055 Message: 9055

Hi All
The LEE-39+ and ERA-33SM+ amplifier group buy demand has tailed off now, so I will shortly be getting a confirmed price for the quantity so far and will be in a position to produce an all in cost for your order.
Once that's done, I will give an order close date and then ask for payment by PayPal, using the personal/gift route of payment, I will use your PayPal postal address unless you state otherwise. My PayPal address to follow later.
If you have only just come across the Amp group buy and want to participate, please see messages 8958,8962 and 8986 for more information.
Regards
Steve g7was.

9056. Re: [spectrumanalyzer] Re: Cavity filter construction (Len's soldering hints and secrets) 5 CAVITIES

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 13:08:38 UTC
From: william sprowls
Topic: 9053 Message: 9056

Hi Len,
 Since you bring that up....
A 5 banger is definitely an overkill. With 4 you can expect the image alias to be greater than -100 dBc. With 5 you can expect the image alias to be greater than -125 dBc. Over the many years I have used SA's, input image frequencies are rarely stronger than the signal of interest. Since the nominal dynamic range of the MSA is 100 dB, the image will not be seen.
 As Len suggests, there is a down side to using 5 cavities. The Coaxial Cavity filter is temperature sensitive to phase change. Only significant when in the VNA Mode. The extra cavity will increase this sensitivity 20 %. Perhaps, not a big deal, but still you will be adding more error when it is unnecessary.
Scotty

--- On Tue, 12/20/11, Len <redmond2@...> wrote:

From: Len <redmond2@...>
Subject: [spectrumanalyzer] Re: Cavity filter construction (Len's soldering hints and secrets) 5 CAVITIES
To: spectrumanalyzer@yahoogroups.com
Date: Tuesday, December 20, 2011, 1:52 AM

Re: Can I build five cavity filter? I can do it, but ,maybe best to first ask our guru Scotty if he foresees any downs or even if there are any ups at all. I would expect more attenuation another -2-3 db and perhaps steeper- complex phase shifts, ripples? I was contemplating building a 1x and 2x filter for possible SAW projects. So I could couple a current 4x and 1x proto and suck it and see. I have qty 20 raw cut pipes and posts (spare) at the moment so no problem there.Price of current 4x cavity = U$80 assembled and tested, so 5x cavity = U$100. Postage for a 5x or 4x+1x may be a big price step the 4 x is 0.495 Kg just inside the OZ post office < 0.5Kg cheaper rate. RegardsLen Spyker

9057. Re: Incoherent Averaging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 13:44:12 UTC
From: Sam
Topic: 9047 Message: 9057

Neal,
We accomplish a lot of averaging with the video filter. Mathematical averaging of multiple readings is used in the path calibration procedure, which requires about 5 seconds to produce a result.

Scanning with the XNarrow filter is already very slow and averaging multiple readings would make it even slower. I have thought about doing what I think is called "exponential averaging", where on each scan the old data is replaced with a weighted average of that data with the new data. This is actually the same as normal averaging except you are not averaging a fixed number of scans; you are always averaging all the data since the last Restart. The advantage of the exponential approach is that you don't have to save a lot of scan data in order to be able to drop the oldest when you add the newest. It would be very simple to implement in the software without creating additional data arrays.

It would still take a long time (i.e. many scans) to produce a full set of data with a lot of averaging, but at least you would be able to watch the full scans as they get refined. Depending on how well this works, it could make the XNarrow video filter unnecessary.

An issue that I have thought about without any conclusion is the difference between these two methods of averaging: (1) averaging voltages at the ADC, which the video filter does, and which is also the same as mathematically averaging ADC readings, and (2) averaging dBm readings, which are the values the ADC readings get converted into using the path cal file. The two are different, especially when the conversion from ADC to dBm is not linear. A related issue is that averaging power in dBm is different from averaging it in mW--I believe the arithmetic mean of dBm values is equal to the geometric mean of mW values. I think the bottom line is that averaging is a useful way to identify whether a signal is there, but does not necessarily produce a precise, unequivocal value for the signal strength.

Sam W.

--- In spectrumanalyzer@...m, "nealmartini" <nealmartini@...> wrote:
>
> Sam,
>
> Have you ever tried to implement an averaging capability in the MSA software? I know the MSA output spectra have no phase syncronization, but averaging would definitely reduce the power spectrum's noise variance, which would help especially at the low levels your currently discussing.
>
> Neal
>

9058. Re: Zero Response and Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 16:13:38 UTC
From: Sam
Topic: 9038 Message: 9058

Lin,
Your idea for an isolation amp on the LO1->Mixer 4 path made me curious about the source of the IF2 spur (assume IF2=10.7). Of course, it ultimately comes from the fact that when you are tuned to the IF frequency, LO1=LO2=LO3-10.7. Thus, if LO3 gets into Mixer 2, you will get the spur. Scotty's LO2 isolation amp prevents LO3 from leaking into LO2 via Mixer 3. As I understand it, that got rid of his IF2 spur (but not the unrelated DDS3 spur that is close by).

Your proposed amp prevents LO3 from leaking into Mixer 1, then through the cavity filter to Mixer 2. You reported that this zaps the remaining IF2 spur. What made me curious is that LO3 at this point is 21.4 MHz above the cavity center, and it should not be possible for a noticeable amount to pass through the cavity filter. In fact, I looked at the Mixer 1 output, and the level of LO3 was not even visible, (hence below -80 dBm), so even modest attenuation by the cavity filter would zap it. Yet I get the IF2 spur.

I believe I have figured out the mechanism, which we should be able to eliminate by filtering the Mixer 1 output to eliminate signals above 2 GHz.

LO3 leaks through Mixer 4 and the PLO1 module into Mixer 1. There it produces various mixing products, including 2LO1+LO3. (Remember, the second harmonic content of LO1 is extremely high.) Due to the periodic nature of cavity filters, a significant portion of this signal leaks through the cavity filter and mixes with LO2:

(2*LO1+LO3)-3*LO2=LO3-LO1=10.7 MHz (because LO1=LO2)

And there is your spur. I was originally thrown off track by the fact that the spur has the same width as the RBW, which suggested harmonics were not involved. But this mechanism does not involve a harmonic of LO3, even though it involves high frequency components.

The offending signal, 2*LO2+LO3, is above 3 GHz and should be easy to filter out. Similar filtering may help reduce the LO1 leakage spurs, so a filter that is strong above 2 GHz would be ideal.

If I am correct, the additional isolation amp would not be necessary.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> A buffer amplifier between LO1 and mixer4 would helpful. i.e. we need two buffer amplifers, one to isolate LO2 and one to isolate LO1.
> A while ago, I putlished some photo here:
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/2017591641/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
>
> by adding one more buffer amplifier between LO1 and mixer 4, it fixed the problem.
> Lin

>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Now that I have improved the lower limit for my MSA, I decided to repeat the graph of my zero response, which can now be seen hitting -128 dBm at 500 kHz. Photo is in the SamW photo album. This also demonstrates how you can get useful info in VNA mode well below the level of the "minimum visible signal" in SA mode. Had I thought of this earlier, I would have done this with the 30 dB amp when I had that in place. But that would also require recalibrating, which I don't feel like doing.
> >
> > I also did a scan for the LO1 leakage spurs that arise from LO1 leaking through Mixer 1 and the cavity filter and reaching Mixer 2. That photo is also in the SamW album. I have a bunch of such spurs, but none is above -100 dBm. I suspect some of these actually arise from leakage of LO1 harmonics, which I plan to try to filter out.
> >
> > Sam W.
> >
>

9059. Re: Zero Response and Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 19:03:15 UTC
From: Sam
Topic: 9038 Message: 9059

Well, I had a great theory but it was a load of bull. The answer to the IF2 spur is very simple. LO3 that leaks into LO1 produces IF1 directly in Mixer 1:

2*LO1-LO3=2*LO1 - (LO1+10.7) = LO1-10.7 = IF1

This is true when you tune to 10.7 MHz (=assumed IF2) because LO1=LO2=IF1+10.7, and LO3 always equals LO1+10.7. This IF1 of course zips right through the cavity filter to Mixer 2 where it mixes with LO2 to produce 10.7 MHz.

The bad news is that you can't eliminate this by filtering out high frequencies. I verified that in fact my Mixer 1 had IF1 output of about -100 dBm when tuned to 10.7 MHz.

The good news is that I tried a low pass filter to eliminate the leakage of LO1 harmonics, which zapped several of my LO1 leakage spurs, leaving just the ones near 8 MHz and 13.3 MHz (N=4) and the one near 21.4 MHz (N=1). I'm not sure why those survived.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
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> Lin,
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> I believe I have figured out the mechanism, which we should be able to eliminate by filtering the Mixer 1 output to eliminate signals above 2 GHz.
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> (2*LO1+LO3)-3*LO2=LO3-LO1=10.7 MHz (because LO1=LO2)
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> And there is your spur. I was originally thrown off track by the fact that the spur has

the same width as the RBW, which suggested harmonics were not involved. But this mechanism does not involve a harmonic of LO3, even though it involves high frequency components.
>
> The offending signal, 2*LO2+LO3, is above 3 GHz and should be easy to filter out. Similar filtering may help reduce the LO1 leakage spurs, so a filter that is strong above 2 GHz would be ideal.
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> If I am correct, the additional isolation amp would not be necessary.
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> > A buffer amplifier between LO1 and mixer4 would helpful. i.e. we need two buffer amplifers, one to isolate LO2 and one to isolate LO1.
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> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > > Now that I have improved the lower limit for my MSA, I decided to repeat the graph of my zero response, which can now be seen hitting -128 dBm at 500 kHz. Photo is in the SamW photo album. This also demonstrates how you can get useful info in VNA mode well below the level of the "minimum visible signal" in SA mode. Had I thought of this earlier, I would have done this with the 30 dB amp when I had that in place. But that would also require recalibrating, which I don't feel like doing.
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> > >
> > > Sam W.
> > >
> >
>

9060. Amp group buy transformer addition if interested.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 23:13:51 UTC
From: s.staines@cranfield.ac.uk
Topic: 9060 Message: 9060

Hi All
I have been thinking about having a play with some ADTT1-1 transformers, but the cost for three is very expensive. Would anybody be interested in increasing the numbers and bring the price down to a more acceptable level. It would just be an addition to the Amp order. Cost would be about £12 + p&p. If you are interested please reply using this email
g7wasgroupbuy(@)gmail.com
remove the brackets. Do not reply via this Yahoo group.
Regards
Steve g7was.

9061. Re: [spectrumanalyzer] Amp group buy transformer addition if interested.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-20 23:47:23 UTC
From: Bill Maxwell
Topic: 9060 Message: 9061

Is that for 3 or 1, Steve?
Bill VK7MX

On 21/12/2011 10:13 AM, s.staines@... wrote:
> Hi All
> I have been thinking about having a play with some ADTT1-1 transformers, but the cost for three is very expensive. Would anybody be interested in increasing the numbers and bring the price down to a more acceptable level. It would just be an addition to the Amp order. Cost would be about ?12 + p&p. If you are interested please reply using this email
> g7wasgroupbuy(@)gmail.com
> remove the brackets. Do not reply via this Yahoo group.
> Regards
> Steve g7was.
>
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> Yahoo! Groups Links
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9062. Re: Zero Response and Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-21 00:09:46 UTC
From: Sam
Topic: 9038 Message: 9062

More good news on spurs. After adding a 1.1 GHz low pass filter to the cavity input, several of the "LO1 leakage spurs" were eliminated, but several remained. In addition, I still had the IF2 spur. After some poking around I realized that PLO1 and PLO2 in my build are adjacent to each other, and that if I pressed on the lid of PLO1 the remaining spurs dropped 2 dB. The lids on those modules overlap the fencing a tiny bit, so I ran a soldering iron around the edge while pressing down so the lid made better contact with the side fence. I got a 4 dB improvement for doing so on PLO1 and 4 more for doing it on PLO2, for a total reduction of 8 dB. That puts me in good shape for all the spurs from 5-22 MHz. Some were eliminated and the others were reduced so all are below -105 dBm, some well below that.

Here is what I believe I have established:

1. First, if your IF2 is 10.7 MHz, here are the spurs at issue; if you have a different IF2, the frequencies will change proportionately:

5.3500
7.1333
8.0250
8.5600
8.9167
9.1714
9.3625
12.0375
12.2286
12.4833
12.8400
13.3750
14.2667
16.0500
21.4000

The above are LO1 leakage spurs. Their distinguishing characteristic is that they all differ from 10.7 MHz by a multiple of 10.7/N, where N is any number 1 through 8.

In addition, there is the IF2 spur at 10.7 MHz.

2. I did not have visible spurs at all these frequencies, but the ones I did have were eliminated by the low pass filter, except the following:
8.025, 10.7, 13.375 and 21.4

All of the eliminated LO1 leakage spurs actually arise from leakage of LO1 harmonics, not LO1 fundamental.

While these remaining ones could be created by LO1 leakage through the cavity filter (except 10.7), they also have other mechanisms (see below)

3. The more stubborn spurs listed in 2 above were either caused by LO1 leaking directly to LO2 (or vice versa) or by poor isolation within the PLO modules. I inspected the lid joints before messing around, and they seemed solidly sealed, so I am not convinced there was direct leakage from one module to the other. So I tend to think the isolation between the two outputs in each module improved with the re-soldering. I'm out of my depth on this, but I wonder whether the isolation is improved when there is good brass-to-brass contact between lid and fencing so any lid current can reach ground without going through a lot of lead.

Before re-soldering the PLO lids, I removed my low pass filter, so it is conceivable that the remaining portion of the spurs listed in #2 will be eliminated when I restore it.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
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> > > >
> > > > Sam W.
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> > >
> >
>

9063. Re: Zero Response and Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-21 01:13:45 UTC
From: Sam
Topic: 9038 Message: 9063

I forgot to mention an important first step. For all <1 GHz signals I used conformable 0.086" coax. However, I found that the coax feeding the MO to PLO2 was leaking PLO2. I fixed that by adding solder to the cable. That improved a few spurs.

If I were to start from scratch, I would use nothing but hardline for any coax that carries or is connected to a module that handles >1GHz. I would also not direct-solder any coax (or maybe in some cases I would do so with one end with an SMA connector at the other end.) However, notwithstanding that, my MSA performance is very good.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> More good news on spurs. After adding a 1.1 GHz low pass filter to the cavity input, several of the "LO1 leakage spurs" were eliminated, but several remained. In addition, I still had the IF2 spur. After some poking around I realized that PLO1 and PLO2 in my build are adjacent to each other, and that if I pressed on the lid of PLO1 the remaining spurs dropped 2 dB. The lids on those modules overlap the fencing a tiny bit, so I ran a soldering iron around the edge while pressing down so the lid made better contact with the side fence. I got a 4 dB improvement for doing so on PLO1 and 4 more for doing it on PLO2, for a total reduction of 8 dB. That puts me in good shape for all the spurs from 5-22 MHz. Some were eliminated and the others were reduced so all are below -105 dBm, some well below that.
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> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Well, I had a great theory but it was a load of bull. The answer to the IF2 spur is very simple. LO3 that leaks into LO1 produces IF1 directly in Mixer 1:
> >
> > 2*LO1-LO3=2*LO1 - (LO1+10.7) = LO1-10.7 = IF1
> >
> > This is true when you tune to 10.7 MHz (=assumed IF2) because LO1=LO2=IF1+10.7, and LO3 always equals LO1+10.7. This IF1 of course zips right through the cavity filter to Mixer 2 where it mixes with LO2 to produce 10.7 MHz.
> >
> > The bad news is that you can't eliminate this by filtering out high frequencies. I verified that in fact my Mixer 1 had IF1 output of about -100 dBm when tuned to 10.7 MHz.
> >
> > The good news is that I tried a low pass filter to eliminate the leakage of LO1 harmonics, which zapped several of my LO1 leakage spurs, leaving just the ones near 8 MHz and 13.3 MHz (N=4) and the one near 21.4 MHz (N=1). I'm not sure why those survived.
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >

> > > Lin,
> > > Your idea for an isolation amp on the LO1->Mixer 4 path made me curious about the source of the IF2 spur (assume IF2=10.7). Of course, it ultimately comes from the fact that when you are tuned to the IF frequency, LO1=LO2=LO3-10.7. Thus, if LO3 gets into Mixer 2, you will get the spur. Scotty's LO2 isolation amp prevents LO3 from leaking into LO2 via Mixer 3. As I understand it, that got rid of his IF2 spur (but not the unrelated DDS3 spur that is close by).
> > >
> > > Your proposed amp prevents LO3 from leaking into Mixer 1, then through the cavity filter to Mixer 2. You reported that this zaps the remaining IF2 spur. What made me curious is that LO3 at this point is 21.4 MHz above the cavity center, and it should not be possible for a noticeable amount to pass through the cavity filter. In fact, I looked at the Mixer 1 output, and the level of LO3 was not even visible, (hence below -80 dBm), so even modest attenuation by the cavity filter would zap it. Yet I get the IF2 spur.
> > >
> > > I believe I have figured out the mechanism, which we should be able to eliminate by filtering the Mixer 1 output to eliminate signals above 2 GHz.
> > >
> > > LO3 leaks through Mixer 4 and the PLO1 module into Mixer 1. There it produces various mixing products, including 2LO1+LO3. (Remember, the second harmonic content of LO1 is extremely high.) Due to the periodic nature of cavity filters, a significant portion of this signal leaks through the cavity filter and mixes with LO2:
> > >
> > > (2*LO1+LO3)-3*LO2=LO3-LO1=10.7 MHz (because LO1=LO2)
> > >
> > > And there is your spur. I was originally thrown off track by the fact that the spur has the same width as the RBW, which suggested harmonics were not involved. But this mechanism does not involve a harmonic of LO3, even though it involves high frequency components.
> > >
> > > The offending signal, 2*LO2+LO3, is above 3 GHz and should be easy to filter out. Similar filtering may help reduce the LO1 leakage spurs, so a filter that is strong above 2 GHz would be ideal.
> > >
> > > If I am correct, the additional isolation amp would not be necessary.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > >
> > > > A buffer amplifier between LO1 and mixer4 would helpful. i.e. we need two buffer amplifers, one to isolate LO2 and one to isolate LO1.
> > > > A while ago, I putlished some photo here:
> > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/2017591641/view?picmode=&mode=tn&order=ordinal&start=61&count=20&dir=asc
> > > >
> > > > by adding one more buffer amplifier between LO1 and mixer 4, it fixed the problem.
> > > > Lin
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:

> > > > >
> > > > > Now that I have improved the lower limit for my MSA, I decided to repeat the graph of my zero response, which can now be seen hitting -128 dBm at 500 kHz. Photo is in the SamW photo album. This also demonstrates how you can get useful info in VNA mode well below the level of the "minimum visible signal" in SA mode. Had I thought of this earlier, I would have done this with the 30 dB amp when I had that in place. But that would also require recalibrating, which I don't feel like doing.
> > > > >
> > > > > I also did a scan for the LO1 leakage spurs that arise from LO1 leaking through Mixer 1 and the cavity filter and reaching Mixer 2. That photo is also in the SamW album. I have a bunch of such spurs, but none is above -100 dBm. I suspect some of these actually arise from leakage of LO1 harmonics, which I plan to try to filter out.
> > > > >
> > > > > Sam W.
> > > > >
> > > >
> > >
> >
>

9064. Re: [spectrumanalyzer] Re: Incoherent Averaging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-21 01:58:28 UTC
From: Neal
Topic: 9047 Message: 9064

Sam,

A few comments on averaging:

1. You definitely need to use a scheme where you can see the spectrum evolve from scan to scan. I don’t know the subtleties of your software, but there are a lot of techniques around for efficiently doing running averages. Digital filters use this a lot.
2. The video filtering that is done by the capacitor at the input to the A to D is across frequency. If you make the assumption that the noise distribution across frequency bins is the same as the noise over time in a specific bin, you do average out some of the noise variations.
3. Averaging power bins over time is, in fact, a way of improving the accuracy of your signal power measurements. If the signal is assumed constant from sweep to sweep and the noise is random, averaging will reduce the erroneous readings that are caused by the noise being randomly added to the stable signal. The signal average will be constant. I don’t have any of my old textbooks with me where I am right now, but I believe the improvement available is something like 10 log sqrt (N), where N is the number of samples you average over. If my formula is right (might be 20 log???), you could get 5 dB of improvement by averaging 10 sweeps.
4.This type of averaging is commonly used in spectrum analyzers for these very reasons. It is also the scheme used in an oscilloscope that has an averaging option.

I think there is a lot to be gained by exploring it a bit.

Neal

From: Sam
Sent: Tuesday, December 20, 2011 5:44 AM
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Re: Incoherent Averaging

Neal,
We accomplish a lot of averaging with the video filter. Mathematical averaging of multiple readings is used in the path calibration procedure, which requires about 5 seconds to produce a result.

Scanning with the XNarrow filter is already very slow and averaging multiple readings would make it even slower. I have thought about doing what I think is called "exponential averaging", where on each scan the old data is replaced with a weighted average of that data with the new data. This is actually the same as normal averaging except you are not averaging a fixed number of scans; you are always averaging all the data since the last Restart. The advantage of the exponential approach is that you don't have to save a lot of scan data in order to be able to drop the oldest when you add the newest. It would be very simple to implement in the software without creating additional data arrays.

It would still take a long time (i.e. many scans) to produce a full set of data with a lot of averaging, but at least you would be able to watch the full scans as they get refined.

Depending on how well this works, it could make the XNarrow video filter unnecessary.

An issue that I have thought about without any conclusion is the difference between these two methods of averaging: (1) averaging voltages at the ADC, which the video filter does, and which is also the same as mathematically averaging ADC readings, and (2) averaging dBm readings, which are the values the ADC readings get converted into using the path cal file. The two are different, especially when the conversion from ADC to dBm is not linear. A related issue is that averaging power in dBm is different from averaging it in mW--I believe the arithmetic mean of dBm values is equal to the geometric mean of mW values. I think the bottom line is that averaging is a useful way to identify whether a signal is there, but does not necessarily produce a precise, unequivocal value for the signal strength.

Sam W.

--- In mailto:spectrumanalyzer%40yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> Sam,
>
> Have you ever tried to implement an averaging capability in the MSA software? I know the MSA output spectra have no phase syncronization, but averaging would definitely reduce the power spectrum's noise variance, which would help especially at the low levels your currently discussing.
>
> Neal
>

9065. Re: Incoherent Averaging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-21 02:07:51 UTC
From: Sam
Topic: 9047 Message: 9065

The real issue is whether additional averaging adds anything to the averaging accomplished by the video filters. In a purely digital system, software averaging is all you have. But the video filter, which averages the signal strength in dBm as opposed to all the voltage points in the time-domain signal, accomplishes a lot. With my video filter switch, which can use a filtering capacitor up to 100 uF, there isn't much noise left.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Neal" <nealmartini@...> wrote:
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> From: Sam
> Sent: Tuesday, December 20, 2011 5:44 AM
> To: spectrumanalyzer@yahoogroups.com
> Subject: [spectrumanalyzer] Re: Incoherent Averaging
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> Neal,
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> --- In mailto:spectrumanalyzer%40yahoogroups.com, "nealmartini" <nealmartini@> wrote:
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> >
> > Neal
> >
>

9066. Re: [spectrumanalyzer] Re: Incoherent Averaging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-21 03:43:07 UTC
From: Neal
Topic: 9047 Message: 9066

I was thinking about this incorrectly. I forgot about the wait time parameter in the MSA. Basically, your sitting on a frequency bin the width of your final filter and averaging out the noise with the A to D capacitor. Long wait + big Cap = Clean signal. I was initially thinking we had a scanning sweep that didn’t stop with my earlier comments. My bad!
Neal

From: Sam
Sent: Tuesday, December 20, 2011 6:07 PM
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Re: Incoherent Averaging

The real issue is whether additional averaging adds anything to the averaging accomplished by the video filters. In a purely digital system, software averaging is all you have. But the video filter, which averages the signal strength in dBm as opposed to all the voltage points in the time-domain signal, accomplishes a lot. With my video filter switch, which can use a filtering capacitor up to 100 uF, there isn't much noise left.

Sam W.

--- In mailto:spectrumanalyzer%40yahoogroups.com, "Neal" <nealmartini@...> wrote:
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> Sam,
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> 3. Averaging power bins over time is, in fact, a way of improving the accuracy of your signal power measurements. If the signal is assumed constant from sweep to sweep and the noise is random, averaging will reduce the erroneous readings that are caused by the noise being randomly added to the stable signal. The signal average will be constant. I donâ□□t have any of my old textbooks with me where I am right now, but I believe the improvement available is something like 10 log sqrt (N), where N is the number of samples you average over. If my formula is right (might be 20 log???), you could get 5 dB of improvement by averaging 10 sweeps.
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> I think there is a lot to be gained by exploring it a bit.
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> Neal
>
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>
>
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> From: Sam
> Sent: Tuesday, December 20, 2011 5:44 AM
> To: mailto:spectrumanalyzer%40yahoogroups.com
> Subject: [spectrumanalyzer] Re: Incoherent Averaging
>
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> Neal,
> We accomplish a lot of averaging with the video filter. Mathematical averaging of multiple readings is used in the path calibration procedure, which requires about 5 seconds to produce a result.
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> >
> > Neal
> >
>

9067. Re: Incoherent Averaging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-21 14:11:59 UTC
From: Sam
Topic: 9047 Message: 9067

Neal,
Correct. In fact, if you use Auto Wait, the MSA takes repeated readings at each point until either the reading is stable or it decides that, due to noise, it will never fully stabilize. That way, you don't waste time waiting on flat areas of the graph.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Neal" <nealmartini@...> wrote:
>
> I was thinking about this incorrectly. I forgot about the wait time parameter in the MSA. Basically, your sitting on a frequency bin the width of your final filter and averaging out the noise with the A to D capacitor. Long wait + big Cap = Clean signal. I was initially thinking we had a scanning sweep that didnâ□□t stop with my earlier comments. My bad!
> Neal
>
>
>
> From: Sam
> Sent: Tuesday, December 20, 2011 6:07 PM
> To: spectrumanalyzer@yahoogroups.com
> Subject: [spectrumanalyzer] Re: Incoherent Averaging
>
>
> The real issue is whether additional averaging adds anything to the averaging accomplished by the video filters. In a purely digital system, software averaging is all you have. But the video filter, which averages the signal strength in dBm as opposed to all the voltage points in the time-domain signal, accomplishes a lot. With my video filter switch, which can use a filtering capacitor up to 100 uF, there isn't much noise left.
>
> Sam W.
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> --- In mailto:spectrumanalyzer%40yahoogroups.com, "Neal" <nealmartini@> wrote:
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> > Sam,
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> > I think there is a lot to be gained by exploring it a bit.
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> > Neal
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> >
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> >
> >
> > From: Sam
> > Sent: Tuesday, December 20, 2011 5:44 AM
> > To: mailto:spectrumanalyzer%40yahoogroups.com
> > Subject: [spectrumanalyzer] Re: Incoherent Averaging
> >
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> > Neal,
> > We accomplish a lot of averaging with the video filter. Mathematical averaging of multiple readings is used in the path calibration procedure, which requires about 5 seconds to produce a result.
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> > >
> > > Neal
> > >
> >
>

9068. Re: [spectrumanalyzer] Re: Incoherent Averaging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-21 16:17:26 UTC
From: Neal
Topic: 9047 Message: 9068

Sam,

I don’t see an auto wait option in the software version I am using. I may have missed an update to the software. What version is it in?

Neal

From: Sam
Sent: Wednesday, December 21, 2011 6:11 AM
To: spectrumanalyzer@yahoogroups.com
Subject: [spectrumanalyzer] Re: Incoherent Averaging

Neal,
Correct. In fact, if you use Auto Wait, the MSA takes repeated readings at each point until either the reading is stable or it decides that, due to noise, it will never fully stabilize. That way, you don't waste time waiting on flat areas of the graph.
Sam W.

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> From: Sam
> Sent: Tuesday, December 20, 2011 6:07 PM
> To: mailto:spectrumanalyzer%40yahoogroups.com
> Subject: [spectrumanalyzer] Re: Incoherent Averaging
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> > >
> > > Neal
> > >
> >
>

9069. Re: Incoherent Averaging

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-21 17:56:45 UTC
From: Sam
Topic: 9047 Message: 9069

Neal,
It's been around since at least 116-4e. It appears next to the normal Wait box. It is explained in the ReadMe file, which is in the zip file that contains the beta versions.

In any case, you should download the current beta, which I have just updated to 116-4q. There are several minor fixes and one important one. Previously, if you used the File menu to save the image or data, it was possible for the File Dialog to crash. That no longer happens.

I have noticed that many people save their images by using screen shots, which, depending on how you do it, saves the entire screen or the entire window (including menu bar and buttons). There is now no reason to do it that way. If you use File->Save Image or Edit->Copy Image, you will get just the graph image, plus the marker info below the graph and the other info on the right of the graph, without getting the menu bar or buttons.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Neal" <nealmartini@...> wrote:
>
> Sam,
>
> I donâ□□t see an auto wait option in the software version I am using. I may have missed an update to the software. What version is it in?
>
> Neal
>
>
> From: Sam
> Sent: Wednesday, December 21, 2011 6:11 AM
> To: spectrumanalyzer@yahoogroups.com
> Subject: [spectrumanalyzer] Re: Incoherent Averaging
>
>
> Neal,
> Correct. In fact, if you use Auto Wait, the MSA takes repeated readings at each point until either the reading is stable or it decides that, due to noise, it will never fully stabilize. That way, you don't waste time waiting on flat areas of the graph.
> Sam W.
>
> --- In mailto:spectrumanalyzer%40yahoogroups.com, "Neal" <nealmartini@> wrote:
> >
> > I was thinking about this incorrectly. I forgot about the wait time parameter in the MSA. Basically, your sitting on a frequency bin the width of your final filter and averaging out the noise with the A to D capacitor. Long wait + big Cap = Clean signal. I was initially thinking we had a scanning sweep that didnÃ¢Â□Â□t stop with my earlier comments. My bad!

> > Neal
> >
> >
> >
> > From: Sam
> > Sent: Tuesday, December 20, 2011 6:07 PM
> > To: mailto:spectrumanalyzer%40yahoogroups.com
> > Subject: [spectrumanalyzer] Re: Incoherent Averaging
> >
> >
> > The real issue is whether additional averaging adds anything to the averaging accomplished by the video filters. In a purely digital system, software averaging is all you have. But the video filter, which averages the signal strength in dBm as opposed to all the voltage points in the time-domain signal, accomplishes a lot. With my video filter switch, which can use a filtering capacitor up to 100 uF, there isn't much noise left.
> >
> > Sam W.
> >
> > --- In mailto:spectrumanalyzer%40yahoogroups.com, "Neal" <nealmartini@> wrote:
> > >
> > > Sam,
> > >
> > > A few comments on averaging:
> > >
> > > 1. You definitely need to use a scheme where you can see the spectrum evolve from scan to scan. I donÃ□Â¢Ã□Â□Ã□Â□t know the subtleties of your software, but there are a lot of techniques around for efficiently doing running averages. Digital filters use this a lot.
> > > 2. The video filtering that is done by the capacitor at the input to the A to D is across frequency. If you make the assumption that the noise distribution across frequency bins is the same as the noise over time in a specific bin, you do average out some of the noise variations.
> > > 3. Averaging power bins over time is, in fact, a way of improving the accuracy of your signal power measurements. If the signal is assumed constant from sweep to sweep and the noise is random, averaging will reduce the erroneous readings that are caused by the noise being randomly added to the stable signal. The signal average will be constant. I donÃ□Â¢Ã□Â□Ã□Â□t have any of my old textbooks with me where I am right now, but I believe the improvement available is something like 10 log sqrt (N), where N is the number of samples you average over. If my formula is right (might be 20 log???), you could get 5 dB of improvement by averaging 10 sweeps.
> > > 4.This type of averaging is commonly used in spectrum analyzers for these very reasons. It is also the scheme used in an oscilloscope that has an averaging option.
> > >
> > > I think there is a lot to be gained by exploring it a bit.
> > >
> > > Neal
> > >
> > >
> > >
> > >
> > >
> > > From: Sam
> > > Sent: Tuesday, December 20, 2011 5:44 AM
> > > To: mailto:spectrumanalyzer%40yahoogroups.com

> > > Subject: [spectrumanalyzer] Re: Incoherent Averaging
> > >
> > >
> > > Neal,
> > > We accomplish a lot of averaging with the video filter. Mathematical averaging of multiple readings is used in the path calibration procedure, which requires about 5 seconds to produce a result.
> > >
> > > Scanning with the XNarrow filter is already very slow and averaging multiple readings would make it even slower. I have thought about doing what I think is called "exponential averaging", where on each scan the old data is replaced with a weighted average of that data with the new data. This is actually the same as normal averaging except you are not averaging a fixed number of scans; you are always averaging all the data since the last Restart. The advantage of the exponential approach is that you don't have to save a lot of scan data in order to be able to drop the oldest when you add the newest. It would be very simple to implement in the software without creating additional data arrays.
> > >
> > > It would still take a long time (i.e. many scans) to produce a full set of data with a lot of averaging, but at least you would be able to watch the full scans as they get refined. Depending on how well this works, it could make the XNarrow video filter unnecessary.
> > >
> > > An issue that I have thought about without any conclusion is the difference between these two methods of averaging: (1) averaging voltages at the ADC, which the video filter does, and which is also the same as mathematically averaging ADC readings, and (2) averaging dBm readings, which are the values the ADC readings get converted into using the path cal file. The two are different, especially when the conversion from ADC to dBm is not linear. A related issue is that averaging power in dBm is different from averaging it in mW--I believe the arithmetic mean of dBm values is equal to the geometric mean of mW values. I think the bottom line is that averaging is a useful way to identify whether a signal is there, but does not necessarily produce a precise, unequivocal value for the signal strength.
> > >
> > > Sam W.
> > >
> > > --- In mailto:spectrumanalyzer%40yahoogroups.com, "nealmartini" <nealmartini@> wrote:
> > > >
> > > > Sam,
> > > >
> > > > Have you ever tried to implement an averaging capability in the MSA software? I know the MSA output spectra have no phase syncronization, but averaging would definitely reduce the power spectrum's noise variance, which would help especially at the low levels your currently discussing.
> > > >
> > > > Neal
> > > >
> > >
> >
>

9070. Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-21 21:16:55 UTC
From: Sam
Topic: 8735 Message: 9070

I have posted scans of my spurs in VNA mode, from zero to 22 MHz. They are in the SamW photo album:
<http://groups.yahoo.com/group/spectrumanalyzer/photos/album/252922278/pic/list>

The low pass filter on the cavity input definitely helped with some spurs, but was not a cure-all. It was not quite as effective as I originally thought. There are still a few strong spurs, but all below -110 dBm. I believe some or all of those arise from construction defects that allow through-the-air leakage within the MSA enclosure. The graphs go down to -128 dBm, and show that there are numerous spurs when you get below -120 dBm, but those are not problematic.

In SA mode, there are fewer spurs. For example, the spur at IF2 goes away when I shift to SA mode.

There are also spurs on the slope of the zero response. I believe most or all of those are not at fixed frequency, but rather locate themselves relative to the tuned frequency and their level is "dBc" relative to the tuned signal strength. They may arise from DDS spurs and thus can also move around a bit.

I have a 7 dB amp at the cavity filter input. This not only provides the added low end range, but weakens all spurs by 7 dB except those that involve a signal passing from Mixer 1 to the cavity filter. That spur weakening does not occur until you re-calibrate with the amp in place.

Sam W.

9071. Amp/Transformer group buy closing soon.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-22 09:27:11 UTC
From: s.staines@cranfield.ac.uk
Topic: 9071 Message: 9071

I have sent out a finalised cost and payment request to all taking part. Most have paid. There are 8 still to pay. I would like to wrap this up.
So if you have a change of mind, please say. The closing date for orders is 23thDec; no more orders will be taken after that date. Payment deadline is the 27th Dec. I will then place the order but only for the people that have paid. So don't miss out.
Regards
And a happy Christmas to all.
Steve g7was

9072. Re: Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-22 11:26:41 UTC
From: davidhooau
Topic: 8735 Message: 9072

Hi Sam,

As your VNA is a rapidly evolving beast, could you give us a snapshot of its evolutionary state, ie. IF2 amp gain, VGA filters, and levels throughout?

Thanks,

david

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have posted scans of my spurs in VNA mode, from zero to 22 MHz. They are in the SamW photo album:
> <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/252922278/pic/list>
>
> The low pass filter on the cavity input definitely helped with some spurs, but was not a cure-all. It was not quite as effective as I originally thought. There are still a few strong spurs, but all below -110 dBm. I believe some or all of those arise from construction defects that allow through-the-air leakage within the MSA enclosure. The graphs go down to -128 dBm, and show that there are numerous spurs when you get below -120 dBm, but those are not problematic.
>
> In SA mode, there are fewer spurs. For example, the spur at IF2 goes away when I shift to SA mode.
>
> There are also spurs on the slope of the zero response. I believe most or all of those are not at fixed frequency, but rather locate themselves relative to the tuned frequency and their level is "dBc" relative to the tuned signal strength. They may arise from DDS spurs and thus can also move around a bit.
>
> I have a 7 dB amp at the cavity filter input. This not only provides the added low end range, but weakens all spurs by 7 dB except those that involve a signal passing from Mixer 1 to the cavity filter. That spur weakening does not occur until you re-calibrate with the amp in place.
>
> Sam W.
>

9073. Expanded Log Detector

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-22 13:37:27 UTC
From: Sam
Topic: 8735 Message: 9073

David
My Expanded Log Detector is as described on my web site, as is my IF2 Amp. I'm pretty sure I haven't changed it since I last updated the web site docs. The schematic changed since the original documentation was done, but the "Even More Updated Schematic and Layout" is current.

Here is a general indication of signal levels, prior to the implementation of the 7 dB pre-cavity amp. I think my Mixer 1 + cavity + Mixer 2 have about 22 dB of loss, so with -120 dBm at MSA input there would be about -142 dBm at the IF2 amp input. With 0 dBm at MSA input I get about -14 dB out of Mixer 1, which turns into -27 dBm at the IF2 amp. The IF2 amp has 28 dB gain so its output is -114 dBm to +1 dBm. That makes the max power to the RWB filters +1 dBm if my MSA input does not go above 0 dBm; if it does, there is the potential for 3 dB more to the filters. With the pre-cavity amp, all these numbers go up 7 dB. (The power at the low levels is actually a few dB higher than I stated, because the signal is mixed with substantial noise.)

My RBW filters are 600 Hz (amplifilter), 8 kHz (canned filter), 30 kHz (dual ceramic) and 400 kHz (dual ceramic). The signal then passes through the AD8330 VGA, then the noise filter, then the regular log detector. The combined VGA+filter+log detector act exactly like a log detector with extended range. In addition to the added range, the wiggle that exists in the response curve of the log detector gets "stretched" so the period of the wiggle is longer, which allows calibration to be done in larger steps.

I use the switched noise filter, which selects either 1 MHz or 15 kHz. I use the narrow noise filter only with the narrowest RBW.

It has been a while since I experimented with the noise filter, but I used to use a single 500 kHz noise filter (single ceramic) that worked quite well. As I recall, when my narrowest RBW was 2 kHz there was no benefit to switching to a narrow noise filter, but when I implemented the amplifilter it seemed like a good idea to build the switched noise filter.

My experiment with a 30 dB pre-cavity amp showed I could get substantially more range at the low end, so my noise filters are not a bottleneck, at least for the narrowest RBW. This may indicate that (unless I actually wanted to use the 30 dB amp) I would have been fine sticking with the fixed 500 kHz filter (plus a 6 dB pad, per the next paragraph). That would be handy because it requires just a single ceramic filter and can be built as an in-line device like an attenuator.

A key discovery that simplified the switched noise filter design is that there was actually an advantage to having some loss in the noise filter, as it caused the log detector to crank up the gain on the VGA a bit, putting the VGA into a lower noise region. Even 10 dB of loss was good.

I don't recall the signal levels at the VGA and log detector, but my ADC readings range from about 6800 to 25500.

As far as other customization of the MSA, I use my "Mixer 3 amp" module, which has dual ERA amps, one for Scotty's LO2 isolation amp and one as a buffer on the TG output, to provide output of -4 dBm while at the same time improving output return loss and preventing high frequency effects from LO1 or LO3 leaking through Mixer 3 and being reflected back in to varying degrees depending on the DUT. Having both amps in one module creates some isolation risk. When I tested it there seemed to be no problem but it is conceivable that with the extra range I have created recently I may have exposed some spurs that arise from leakage between those two amps.

My cavity filter is at 1045.3 MHz, a change I will have to undo if I switch to the SAW. (It's a simple Configuration change.) I have a dual amp module used as a splitter for LO3, in order to provide an LO3 output to use as the tracking generator for 2G mode, though this is probably unnecessary because you can just re-cable the LO3 line feeding Mixer 3, since you don't need the regular TG in 2G mode. (You can run that LO3 line to an external connector, with another connector leading back to Mixer 3, and either jumper the connectors together or remove the jumper to use LO3.)

That's about it.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Hi Sam,
>
> As your VNA is a rapidly evolving beast, could you give us a snapshot of its evolutionary state, ie. IF2 amp gain, VGA filters, and levels throughout?
>
> Thanks,
>
> david
>

9074. Re: Expanded Log Detector

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-22 15:06:09 UTC
From: Sam
Topic: 8735 Message: 9074

I realized I still have my original 500 kHz noise filter, so I tested it against the switched noise filter. The 500 kHz filter, with or without a 6 dB pad, loses approximately 3 dB at the low end. That's with my 7 dB pre-cavity amp. (I didn't test without the amp.) It's worth using if you have it, but maybe not worth building if you don't.

I think I got the effect of the pre-cavity amp backwards in my previous post. That amp results in a stronger signal to the VGA so you could get by with less noise filtering. This means if you don't use the pre-cavity amp, you need more noise filtering and the switched noise filter might provide more benefit at the low end. The difference might not be as much as you would think, because a stronger VGA input results in less VGA gain, so the increased signal level at the VGA output is much less than the increase at the input.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> David
> My Expanded Log Detector is as described on my web site, as is my IF2 Amp. I'm pretty sure I haven't changed it since I last updated the web site docs. The schematic changed since the original documentation was done, but the "Even More Updated Schematic and Layout" is current.
>
> Here is a general indication of signal levels, prior to the implementation of the 7 dB pre-cavity amp. I think my Mixer 1 + cavity + Mixer 2 have about 22 dB of loss, so with -120 dBm at MSA input there would be about -142 dBm at the IF2 amp input. With 0 dBm at MSA input I get about -14 dB out of Mixer 1, which turns into -27 dBm at the IF2 amp. The IF2 amp has 28 dB gain so its output is -114 dBm to +1 dBm. That makes the max power to the RWB filters +1 dBm if my MSA input does not go above 0 dBm; if it does, there is the potential for 3 dB more to the filters. With the pre-cavity amp, all these numbers go up 7 dB. (The power at the low levels is actually a few dB higher than I stated, because the signal is mixed with substantial noise.)
>
> My RBW filters are 600 Hz (amplifilter), 8 kHz (canned filter), 30 kHz (dual ceramic) and 400 kHz (dual ceramic). The signal then passes through the AD8330 VGA, then the noise filter, then the regular log detector. The combined VGA+filter+log detector act exactly like a log detector with extended range. In addition to the added range, the wiggle that exists in the response curve of the log detector gets "stretched" so the period of the wiggle is longer, which allows calibration to be done in larger steps.
>
> I use the switched noise filter, which selects either 1 MHz or 15 kHz. I use the narrow noise filter only with the narrowest RBW.
>
> It has been a while since I experimented with the noise filter, but I used to use a single 500 kHz noise filter (single ceramic) that worked quite well. As I recall, when my narrowest RBW was 2 kHz there was no benefit to switching to a narrow noise filter, but when I implemented the amplifilter it seemed like a good idea to build the switched noise

filter.
>
> My experiment with a 30 dB pre-cavity amp showed I could get substantially more range at the low end, so my noise filters are not a bottleneck, at least for the narrowest RBW. This may indicate that (unless I actually wanted to use the 30 dB amp) I would have been fine sticking with the fixed 500 kHz filter (plus a 6 dB pad, per the next paragraph). That would be handy because it requires just a single ceramic filter and can be built as an in-line device like an attenuator.
>
> A key discovery that simplified the switched noise filter design is that there was actually an advantage to having some loss in the noise filter, as it caused the log detector to crank up the gain on the VGA a bit, putting the VGA into a lower noise region. Even 10 dB of loss was good.
>
> I don't recall the signal levels at the VGA and log detector, but my ADC readings range from about 6800 to 25500.
>
> As far as other customization of the MSA, I use my "Mixer 3 amp" module, which has dual ERA amps, one for Scotty's LO2 isolation amp and one as a buffer on the TG output, to provide output of -4 dBm while at the same time improving output return loss and preventing high frequency effects from LO1 or LO3 leaking through Mixer 3 and being reflected back in to varying degrees depending on the DUT. Having both amps in one module creates some isolation risk. When I tested it there seemed to be no problem but it is conceivable that with the extra range I have created recently I may have exposed some spurs that arise from leakage between those two amps.
>
> My cavity filter is at 1045.3 MHz, a change I will have to undo if I switch to the SAW. (It's a simple Configuration change.) I have a dual amp module used as a splitter for LO3, in order to provide an LO3 output to use as the tracking generator for 2G mode, though this is probably unnecessary because you can just re-cable the LO3 line feeding Mixer 3, since you don't need the regular TG in 2G mode. (You can run that LO3 line to an external connector, with another connector leading back to Mixer 3, and either jumper the connectors together or remove the jumper to use LO3.)
>
> That's about it.
>
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> >
> > Hi Sam,
> >
> > As your VNA is a rapidly evolving beast, could you give us a snapshot of its evolutionary state, ie. IF2 amp gain, VGA filters, and levels throughout?
> >
> > Thanks,
> >
> > david
> >
>

9075. Re: [spectrumanalyzer] Amp group buy transformer addition if interested.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-22 17:04:18 UTC
From: Chris
Topic: 9060 Message: 9075

Hi Steve I have some MCL T1-1 transformers that you could have if you think they would do
cheers Chris
----- Original Message -----
From: Bill Maxwell
To: spectrumanalyzer@yahoogroups.com
Sent: Tuesday, December 20, 2011 11:47 PM
Subject: Re: [spectrumanalyzer] Amp group buy transformer addition if interested.

Is that for 3 or 1, Steve?
Bill VK7MX

On 21/12/2011 10:13 AM, s.staines@... wrote:

Hi All
I have been thinking about having a play with some ADTT1-1 transformers, but the cost for three is very expensive. Would anybody be interested in increasing the numbers and bring the price down to a more acceptable level. It would just be an addition to the Amp order. Cost would be about £12 + p&p. If you are interested please reply using this email
g7wasgroupbuy(@)gmail.com
remove the brackets. Do not reply via this Yahoo group.
Regards
Steve g7was.

Yahoo! Groups Links

No virus found in this message.
Checked by AVG - www.avg.com
Version: 2012.0.1890 / Virus Database: 2109/4694 - Release Date: 12/21/11

9076. Reducing Spurs

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-22 18:22:43 UTC
From: Sam
Topic: 9076 Message: 9076

Since I just spent some time locating and trying to reduce my spurs, I thought I would post a list of hints:

1. You should carefully inspect every soldered seam in your lids and fencing. Likewise, inspect where coax is soldered to a connector or directly to the board.

2. Be sure all connectors are tight. It is amazing how much leakage you can get from an SMA connector being just slightly loose. That is true even at 10.7 MHz. Ideally, they should be just slightly tighter than hand tight.

3. Sometimes a connector binds a bit when it is not close to being tight. If this happens within the first turn or two, it is probably cross-threaded. It may also happen after several turns, so you think it is "hand tight", but if you turn it a little more with a tool it breaks free and may go another turn or two. I use the torque tool that Lin recommended; I think they jacked the price up a bit but it is still just $25: <http://www.kcrproducts.com/catalog/product_info.php?products_id=38&osCsid=7nt46iogac496equ6ptba799p4>

This not only gets the proper torque (even for right angle connectors that you have to access from the top), but is handy for reaching through a maze of cables where it is hard to get your fingers.

4. To actually locate a bad spot, I have found sniffers to be not very useful, unless you have a massive leak. Somehow they seem to pick up low level signals even if you touch them to the outside of the chassis. It is hard to localize the source of the problem with a sniffer, partly because you cannot limit the sniffer to picking up signals from just one module or cable. Also, the spur problem may be caused by very high frequencies beyond the range of your sniffer.

5. I have found poking my finger around to be the best technique. By putting my finger between two adjacent cables, or around the seams of a lid, or simply pressing on things, I can tell if something is going on there. Whether your finger makes the spurs better or worse, you have found something. To make this feasible, you may have to focus on a particular spur so you can have rapid scans to make it faster to see whether your finger is making a difference.

6. You may find that moving the power and logic wires affects spurs. I don't think that is necessarily an indication that RF is leaking out of modules through those wires. I think it is more likely that the wires affect through-the-air crosstalk that starts and ends elsewhere.

7. Crosstalk between the two outputs of each PLO, or between mixer inputs and outputs is a definite candidate for causing spurs, though it's hard to do anything about that other than maybe put a small capacitor somewhere or use microwave absorbing material. (Also, be sure the SMA connector pins don't stick up in the air.) I know some people use carbon-bearing anti-static foam for this purpose, but I did some tests to see what effect various materials have on leakage between an input and output connector in an otherwise empty metal

box, and the foam did nothing. The best practical material I found was bare FR-4, which kicks in slowly above 1 GHz and is pretty effective at 3 GHz. I didn't try the expensive true microwave stuff.

8. Conformable cable (the tin-dipped flexible shield type) can be a problem, especially where two cables are close together and/or they are bent sharply. The specs for such cable are normally quite good, but maybe you have cheap cable or maybe bending created openings in the shield. You can fix this problem by adding solder to the shield where necessary.

Sam W.

9077. 1 and 2 Cavity Coax Filters

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-22 23:09:19 UTC
From: spyker49
Topic: 9077 Message: 9077

Hello
For those doing SAW development needing 1 or 2 cavity coax filters I am happy to loan some, no costs involved.
Contact me on redmond2@....au

9078. Re: Expanded Log Detector

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-23 10:40:15 UTC
From: inlinebeginner
Topic: 8735 Message: 9078

Sam
" With 0 dBm at MSA input I get about -14 dB out of Mixer 1"
Looks like at high power Mixer1 insertion loss is far away from 7dB normal value. I think we need to characterize mixer 1 at hihg power, to see what the insertion loss is.

As you add 7dB gain in PreCavity Amp, the RBW may see 7dBm at 0dBm MSA input. To avoid this overdriving, you may consider to change the 28dB IF2 back to Scotty's IFA2 (19.5dB gain), and adjust the VGA range. Before you adjust your VGA, the VGA gain seems to be 42dB at low power (-125dBm at MSA input). This VGA can work up to 54dB gain, therefore, you may be able to shift it. i.e. you move about 7dB gain from RBW input side to its output side to avoid RBW overdriving, while the total gain still keeps the same.

Lin

If you can use the full range of VGA, you may use Scotty's original

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> David
> My Expanded Log Detector is as described on my web site, as is my IF2 Amp. I'm pretty sure I haven't changed it since I last updated the web site docs. The schematic changed since the original documentation was done, but the "Even More Updated Schematic and Layout" is current.
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> I don't recall the signal levels at the VGA and log detector, but my ADC readings range from about 6800 to 25500.
>
> As far as other customization of the MSA, I use my "Mixer 3 amp" module, which has dual ERA amps, one for Scotty's LO2 isolation amp and one as a buffer on the TG output, to provide output of -4 dBm while at the same time improving output return loss and preventing high frequency effects from LO1 or LO3 leaking through Mixer 3 and being reflected back in to varying degrees depending on the DUT. Having both amps in one module creates some isolation risk. When I tested it there seemed to be no problem but it is conceivable that with the extra range I have created recently I may have exposed some spurs that arise from leakage between those two amps.
>
> My cavity filter is at 1045.3 MHz, a change I will have to undo if I switch to the SAW. (It's a simple Configuration change.) I have a dual amp module used as a splitter for LO3, in order to provide an LO3 output to use as the tracking generator for 2G mode, though this is probably unnecessary because you can just re-cable the LO3 line feeding Mixer 3, since you don't need the regular TG in 2G mode. (You can run that LO3 line to an external connector, with another connector leading back to Mixer 3, and either jumper the connectors together or remove the jumper to use LO3.)
>
> That's about it.
>
> Sam W.
>
>
> --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> >
> > Hi Sam,
> >
> > As your VNA is a rapidly evolving beast, could you give us a snapshot of its evolutionary state, ie. IF2 amp gain, VGA filters, and levels throughout?
> >
> > Thanks,
> >
> > david

> >
>

9079. Re: Expanded Log Detector

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-23 14:49:21 UTC
From: Sam
Topic: 8735 Message: 9079

Lin,
If you think of the mixer as using an LO to turn the RF on and off, what happens at high RF power is that the RF itself is able to partly turn the diodes on and off, so you get less "mixing" action. If I go from 0 dBm to 10 dBm at the MSA input, Mixer 1's output at IF1 increases only 3 dB.

Scotty's IF2 amp is a dual unit with a total of 40 dB gain. Even with the 7 dB pre-cavity amp, my total pre-RBW gain is only 35 dB. The RBW filters might still receive more power than you would normally use for a filter, creating considerable distortion, but it is a safe level. (Even the 40 dB gain appears to be safe.)

Due to distortion in Mixer 1, you would normally keep the input level well below 0 dBm when in SA mode, unless you simply want to measure the approximate power level. And in VNA modes the input level will normally be no higher than the TG level. So my goal for MSA inputs of 0 dBm and a little bit higher is just to get modest responsiveness and not destroy anything.

Lowering the IF2 amp gain and raising the VGA gain increases the noise level by partially bypassing the noise filtering done by the RBW filters.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> " With 0 dBm at MSA input I get about -14 dB out of Mixer 1"
> Looks like at high power Mixer1 insertion loss is far away from 7dB normal value. I think we need to characterize mixer 1 at hihg power, to see what the insertion loss is.
>
> As you add 7dB gain in PreCavity Amp, the RBW may see 7dBm at 0dBm MSA input. To avoid this overdriving, you may consider to change the 28dB IF2 back to Scotty's IFA2 (19.5dB gain), and adjust the VGA range. Before you adjust your VGA, the VGA gain seems to be 42dB at low power (-125dBm at MSA input). This VGA can work up to 54dB gain, therefore, you may be able to shift it. i.e. you move about 7dB gain from RBW input side to its output side to avoid RBW overdriving, while the total gain still keeps the same.
>
> Lin
>
> If you can use the full range of VGA, you may use Scotty's original
>
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > David
> > My Expanded Log Detector is as described on my web site, as is my IF2 Amp. I'm pretty sure I haven't changed it since I last updated the web site docs. The schematic changed

since the original documentation was done, but the "Even More Updated Schematic and Layout" is current.
> >
> > Here is a general indication of signal levels, prior to the implementation of the 7 dB pre-cavity amp. I think my Mixer 1 + cavity + Mixer 2 have about 22 dB of loss, so with -120 dBm at MSA input there would be about -142 dBm at the IF2 amp input. With 0 dBm at MSA input I get about -14 dB out of Mixer 1, which turns into -27 dBm at the IF2 amp. The IF2 amp has 28 dB gain so its output is -114 dBm to +1 dBm. That makes the max power to the RWB filters +1 dBm if my MSA input does not go above 0 dBm; if it does, there is the potential for 3 dB more to the filters. With the pre-cavity amp, all these numbers go up 7 dB. (The power at the low levels is actually a few dB higher than I stated, because the signal is mixed with substantial noise.)
> >
> > My RBW filters are 600 Hz (amplifilter), 8 kHz (canned filter), 30 kHz (dual ceramic) and 400 kHz (dual ceramic). The signal then passes through the AD8330 VGA, then the noise filter, then the regular log detector. The combined VGA+filter+log detector act exactly like a log detector with extended range. In addition to the added range, the wiggle that exists in the response curve of the log detector gets "stretched" so the period of the wiggle is longer, which allows calibration to be done in larger steps.
> >
> > I use the switched noise filter, which selects either 1 MHz or 15 kHz. I use the narrow noise filter only with the narrowest RBW.
> >
> > It has been a while since I experimented with the noise filter, but I used to use a single 500 kHz noise filter (single ceramic) that worked quite well. As I recall, when my narrowest RBW was 2 kHz there was no benefit to switching to a narrow noise filter, but when I implemented the amplifilter it seemed like a good idea to build the switched noise filter.
> >
> > My experiment with a 30 dB pre-cavity amp showed I could get substantially more range at the low end, so my noise filters are not a bottleneck, at least for the narrowest RBW. This may indicate that (unless I actually wanted to use the 30 dB amp) I would have been fine sticking with the fixed 500 kHz filter (plus a 6 dB pad, per the next paragraph). That would be handy because it requires just a single ceramic filter and can be built as an in-line device like an attenuator.
> >
> > A key discovery that simplified the switched noise filter design is that there was actually an advantage to having some loss in the noise filter, as it caused the log detector to crank up the gain on the VGA a bit, putting the VGA into a lower noise region. Even 10 dB of loss was good.
> >
> > I don't recall the signal levels at the VGA and log detector, but my ADC readings range from about 6800 to 25500.
> >
> > As far as other customization of the MSA, I use my "Mixer 3 amp" module, which has dual ERA amps, one for Scotty's LO2 isolation amp and one as a buffer on the TG output, to provide output of -4 dBm while at the same time improving output return loss and preventing high frequency effects from LO1 or LO3 leaking through Mixer 3 and being reflected back in to varying degrees depending on the DUT. Having both amps in one module creates some isolation risk. When I tested it there seemed to be no problem but it is conceivable that with the extra range I have created recently I may have exposed some spurs that arise from

leakage between those two amps.
> >
> > My cavity filter is at 1045.3 MHz, a change I will have to undo if I switch to the SAW. (It's a simple Configuration change.) I have a dual amp module used as a splitter for LO3, in order to provide an LO3 output to use as the tracking generator for 2G mode, though this is probably unnecessary because you can just re-cable the LO3 line feeding Mixer 3, since you don't need the regular TG in 2G mode. (You can run that LO3 line to an external connector, with another connector leading back to Mixer 3, and either jumper the connectors together or remove the jumper to use LO3.)
> >
> > That's about it.
> >
> > Sam W.
> >
> >
> > --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> > >
> > > Hi Sam,
> > >
> > > As your VNA is a rapidly evolving beast, could you give us a snapshot of its evolutionary state, ie. IF2 amp gain, VGA filters, and levels throughout?
> > >
> > > Thanks,
> > >
> > > david
> > >
> >
>

9080. SAW 1013 MHz Filter Group Buy Notification

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-23 18:51:32 UTC
From: nealmartini
Topic: 9080 Message: 9080

SAW Filter Orderers,

If you ordered set(s) of SAW filter components through the group buy process we are doing, you should have received a direct email from me notifying you about how to complete the order process and make payment through PayPal.

If you did not receive that email do one of the following:
1. Check the files in your SPAM blocker to make sure the email didn't get Spam filtered out.
2. If the SPAM check doesn't show anything, send me a direct email (nealmartini@...) and I will resend you the instructions.

Neal

9081. Amp/Transformer Group buy CLOSED for orders.

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-23 20:52:29 UTC
From: s.staines@cranfield.ac.uk
Topic: 9081 Message: 9081

The amp and transformers group buy is now CLOSED.
I have just the one interested party Andreas, who snuck in just before the close,
Could you make payment soon so I can wrap it up before festivities start?
Regards all
Steve g7was.

9082. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-23 21:41:13 UTC
From: inlinebeginner
Topic: 9018 Message: 9082

This is a good VGA: 250MHz to 4GHz, Dual 22dB each.
http://www.maxim-ic.com/datasheet/index.mvp/id/6573
Less than $6 if you buy from digikey.
http://search.digikey.com/scripts/DkSearch/dksus.dll?lang=en&site=us&KeyWords=max19790

250MHz to 4000MHz RF Frequency Range
Integrates Two Analog Attenuators in One Monolithic Device
Flexible Attenuation-Control Ranges
22dB (per Attenuator)
44dB (Both Attenuators Cascaded)
2.4dB 1500MHz Insertion Loss (per Attenuator)
Linear dB/V Analog Control Response Curve Simplifies Automatic Leveling Control and Gain-Trim Algorithms
Excellent Attenuation Flatness Over Wide Frequency Ranges and Attenuation Settings
Low 7.3mA Supply Current
Single +5.0V Supply Voltage

Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Lin,
> Not bad for $1.71. That would work well if you used it preceding a 20-30 dB amp and could manipulate the control voltage (derived from the log detector output) so that it would be somewhere between 2.5 and 5 V when the MSA input signals are weak and a very steady value somewhere between 0.5 V and 1 V when the input reaches a level where no amplification is needed any more.
>
> The attenuation curve has a bit of wiggle, but if the attenuation became fixed above a certain input level, any error caused by the wiggle would not mean much since it would only affect low level signals (-105 dBm vs. -105.3 dBm is no big deal), or you could simply calibrate at small intervals.
>
> They don't show the effect of temperature on attenuation but they do show the effect on individual diode resistance. It seems reasonably small, especially if you are at normal room temperature or above, as the inside of the MSA would normally be.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > with a OPAM inverter, HSMP-3866 may work.
> > http://www.avagotech.com/docs/AV02-1962EN
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:

> > >
> > > As we only working at 1013.3MHz, it may not be a difficult work to construct a PIN attenuator. Or can find a product:
> > > http://www.rflambda.com/pdf/voltageattenuator/RFVAT0102A30.pdf
> > >
> > > DIY tutorial:
> > > http://palgong.kyungpook.ac.kr/~ysyoon/Pdf/an1048.pdf
> > > http://www.odyseus.nildram.co.uk/RFMicrowave_Circuits_Files/Attenuator.pdf
> > >
> > > Lin
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >
> > > > It can all work as long as you don't overload anything along the way. A VGA immediately before or after the cavity filter would have to be able to handle inputs of at least -15 or -20 dBm along with the desired signal without becoming saturated in order to work well in SA mode. And have low noise. As a practical matter, I suspect you would need a small fixed gain low-noise amp followed by a VGA in order to minimize the effects of VGA noise.
> > > >
> > > > The expanded log detector was intended to be linear-in-db over as broad a range as possible, but because of our path calibration this linearity is not actually critical for the MSA. Any voltage-controlled mechanism would work that has high gain at low inputs and drops the gain at higher inputs, as long as the drop is not so abrupt as to require calibration at fine intervals. If would even be fine for the gain to hit its minimum at fairly low input levels, such as -90 dBm. Something as simple as a PIN diode attenuator could work, if it has reasonable temperature stability.
> > > >
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > >
> > > > > Sam
> > > > > My calculation is very conservitive. The -120dBm input is map to the linear area -90dBm of log detector, and the noise floor of log detector is around -100dBm. i.e. the 120dBm is very decent measurement. If we just want to identify the signal above the noise floor, the calculated signal leve at MSA input should be around -128 dBm. Also, I use 1kHz RBW filter in my calculation, not 600Hz, the log detector is also the original Scotty's log detector, not the expended log detector. Your expended log detector actually contains one VGA already.
> > > > > Here is how I calculated: The overall NF=16dB, overall gain 29. The noise floor at log detector input: -174 +16 + 29 + 30 = -99dBm. Log detector minimum input level is around -99dBm, at that area is very non-linear. However, starting from -91dBm to +15dBm, log detector has very good linearity, therefore, if we map -91dBm back to MSA input with the 29dB gain, the signal level will be -91-29=-120dBm. That does not say if we input -128dBm the log detecto won't reponse. becasue if we input -128 at MSA input, with the 29dB gain, the signal will show up at log detector as -99dBm, which is within log detector response range.
> > > > >
> > > > > Lin
> > > > >

> > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > >
> > > > > > Lin,
> > > > > > I'm getting -120 dBm to 0 dBm now, with a fixed 7 dB amp rather than your VGA1.
> > > > > >
> > > > > > If you have a regular need to view lower signals, I think the way to go is to increase the amp gain and use a "manually-controlled attenuator"--i.e insert one when necessary to see high level signals.
> > > > > > If you rarely need the low levels, you can leave the internal amp at 7 dB, or even leave it out, but add an external amp when necessary.
> > > > > >
> > > > > > There is a little-known feature of the software called Front End Compensation, where you can specify a front end that you have added (such as an amp or attenuator) and it will use a calibration file to adjust the readings. You can use the MSA to create the calibration file. This is only needed for SA mode, since in VNA modes the regular operating calibration takes care of the front end.
> > > > > >
> > > > > > Adding attenuators or amps to the input is a way of shifting but not increasing the "simultaneous dynamic range". But it seems to me that if you get that range to 120 dB, the ability to shift it up or down with an attenuator or amp is all you are likely to need. If you have a 20 dB amp for getting to low signals, and a 20 dB attenuator (or maybe a couple), you'll be able to reach everything you want to reach.
> > > > > >
> > > > > > One might even say that the pre-cavity amp is not all that necessary. I was just compulsive about getting a solid -120 to 0 dB range. Plus, I wanted to get an idea what type of range I would get with the SAW module, which I expect will come out in the ballpark of what I get with the pre-cavity amp.
> > > > > >
> > > > > > Sam W.
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > >
> > > > > > > Sam
> > > > > > > This is what I was calculating this morning. Here is what I got:
> > > > > > > The MSA could have range: 0 dBm to -120dBm, with the following VGA config:
> > > > > > >
> > > > > > > For 0dBm input: 3dB pad+ mixer1+ VGA1=10dB + cavity + mixer 2+ VGA2 =0dB + IFA2 + RBW. The log detector will see power around 0dBm.
> > > > > > > For -120 dBm input: VGA1= 20dB, and VGA2=20dB.
> > > > > > >
> > > > > > > To not overload the VGA1, we may put noise filter in front of VGA1 (worst case we can put two cavity filters).
> > > > > > >
> > > > > > > The VGA may not be a real VGA, it could be a ERA-33+ Voltage controlled attenuator, if we can find one.
> > > > > > >
> > > > > > > If we extend this concept, we can put a voltage controlled attenuator at Mixer1 input. That would extend the dynamic range to +20dBm to -120dBm.
> > > > > > >

> > > > > > > Lin
> > > > > > >
> > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > >
> > > > > > > > Lin,
> > > > > > > > > Actually, you can let signals get to the VGA but not the log detector as long as the max gain of the VGA won't allow it to be overloaded by such stray signals. One way to make use of this would be to put a second VGA in front of the RBW filters. The IF2 amp might still be required, but with reduced gain--just enough to keep the noise level down. The second VGA could tie into the same control line as the first, and would have to have its gain limited to 20 dB or so to avoid the possibility of overload.
> > > > > > > >
> > > > > > > > > You could do the same thing at the cavity filter, but finding a reasonably low noise VGA that operates at >1 GHz, and has enough range not to be overloaded, may be a challenge.
> > > > > > > >
> > > > > > > > > Sam W.
> > > > > > > > >
> > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > > >
> > > > > > > > > > Lin,
> > > > > > > > > > > A fundamental limitation of the VGA+log detector concept is that you can't allow signals to reach the VGA unless they will also reach the log detector. Otherwise, a strong signal can overload the VGA without the log detector knowing about it. That is the reason I use the arrangement RBW Filters->VGA->Noise Filter->log detector, with the Noise Filter always broader bandwidth than the RBW filter.
> > > > > > > > >
> > > > > > > > > > You actually could violate this rule for VNA use only, as long as there would never be a spurious signal strong enough to overload the VGA. That might be the case with a VGA located after the cavity filter (maybe even before the cavity) as long as the VGA never had gain greater than 30 dB or so. (The prime overload risk would come from leaked LO1.)
> > > > > > > > >
> > > > > > > > > > Sam W.
> > > > > > > > >
> > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > > >
> > > > > > > > > > > Sam
> > > > > > > > > > > > If we can find a VGA working at 1013.3MHz, we might be able to apply the similar concept of the expended log detector on cavity filter amplifier. i.e. the gain is controlled with the log detector output, at hihger power input, the gain dropes more and at lower power the gain increases more. In this way, we can have larger dynamic range. The overall is a IF amplifer at 1013.3MHz but the BW is determined by the RBW filters.
> > > > > > > > > > Lin
> > > > > > > > >
> > > > > > > > >
> > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
> > > > > > > > >
> > > > > > > > > > How is the response at +21.4?

> > > > > > > > > > >
> > > > > > > > > > > > Jim, W1JGH
> > > > > > > > > > > >
> > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > > > > > > >
> > > > > > > > > > > > > I have now actually installed an amp in front of my cavity filter (ERA-33 attenuated down to 7 dB gain). I'm guessing the performance of this with the cavity filter will be similar to the performance of the SAW module with its internal amp.
> > > > > > > > > > > >
> > > > > > > > > > > > > I recalibrated, though my calibration is not extremely precise because I did it with my MSA upside down with the bottom off and the fan not running, so it was never at thermal equilibrium.
> > > > > > > > > > > >
> > > > > > > > > > > > > My minimum visible signal with 600 kHz RBW is -122 dBm. My goal was to get a stable signal at -120 dBm. Such signal is now very visible, and if I place a marker on it, the value varies (noise) from scan to scan by about 2 dB. As far as I am concerned, that is excellent accuracy for such a low level signal. I can actually get a measurable response below -128 dBm, but if the ADC change per dB is too small, a small bit of noise creates a very erratic graph. So I calibrated down to -128 dBm, but I don't expect much accuracy under -120 dBm.
> > > > > > > > > > > >
> > > > > > > > > > > > > On the high end, I was aiming for useable but not great response at 0 dBm. I get very strong response at -5 dBm and decent response at 0 dBm, and was able to calibrate to 6 dBm with the ADC values still increasing a useful amount.
> > > > > > > > > > > >
> > > > > > > > > > > > > This is all in my 600 Hz RBW path. For wider paths, I lose a couple dB at the high end and varying amounts on the low end.
> > > > > > > > > > > >
> > > > > > > > > > > > > In summary, I have a solid response from -120 dBm to 0 dBm, with at least 5 dB of lesser response added on to each end.
> > > > > > > > > > > >
> > > > > > > > > > > > > Sam W.
> > > > > > > > > > > >
> > > > > > > > > > > >
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9083. MSA_version116_4q_Beta.zip Can't Load Third Filter Data

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-26 04:15:42 UTC
From: nealmartini
Topic: 9083 Message: 9083

Sam

I downloaded your MSA_version116_4q_Beta.zip and I am having a problem when I try and add my third filter to the RBW filter list. I copied my calibration files from an older version of the softare so I wouldn't have to recalibrate. I can add the first two RBW filter datae in the configuratons manager, but if I add a third RBW filter I get a divide by zero error when I try ad start the program.

I must be doing something stupid, but I have trie everything I could think of without success. Help!

Thanks
Neal

9084. Re: MSA_version116_4q_Beta.zip Can't Load Third Filter Data

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-26 14:21:27 UTC
From: Sam
Topic: 9083 Message: 9084

Neal,
There must be something odd in the path calibration file for the offending path, such as two entries for the same ADC value. Could you email me the file?

By the way, you could just replace the old program files (.bas, .tkn and .exe) and you wouldn't have to do anything to the configuration or calibration files. If you are switching from version 115, or a very old version of 116, you can still replace program files but have to perform a couple of additional steps (per the introduction of the ReadMe file).

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "nealmartini" <nealmartini@...> wrote:
>
> Sam
>
> I downloaded your MSA_version116_4q_Beta.zip and I am having a problem when I try and add my third filter to the RBW filter list. I copied my calibration files from an older version of the softare so I wouldn't have to recalibrate. I can add the first two RBW filter datae in the configuratons manager, but if I add a third RBW filter I get a divide by zero error when I try ad start the program.
>
> I must be doing something stupid, but I have trie everything I could think of without success. Help!
>
> Thanks
> Neal
>

9085. SAW Page Update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-26 18:01:19 UTC
From: william
Topic: 9085 Message: 9085

Hi All,
I have been happily playing with the SAW Filters. I have updated the web page:
http://scottyspectrumanalyzer.com/slim_sfa_1013.html
to include more good poop. For example, Len asked for S21 data for the Cavity Filter. I assume for comparison for his latest build.
The next thing to do is actually install the SAW Filters into the Original MSA and take some data. I will update the page to include that.
Scotty

9086. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-27 15:21:41 UTC
From: inlinebeginner
Topic: 9018 Message: 9086

Sam
The high power performance can be improved with the PIN attenautor.
I createded a PIN attenuator and attached it at a 20dB amplifer to be the pre-cavity amp.
The PIN attenuator range is about -12dB to -32dB,test result is here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1951922862/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
It shows that the dynamic range is -120 to +5dBm with 7.5kHZ RBW fitler. With 1kHz RBW filter, it would be -128 to +5dBm.
The curve was measured on a MSA model with your expended log detector. The measurement step is 1dB between -125 to -100dBm, -10 to +5dBm; and 5dB step betwee -100 to -10dBm.
Form the curve, we can see, if we do not put this PIN atten, -8dBm to 0dBm can not be used on my model, the curve goes down if we zoom in.
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/855170073/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc

The PIN attenuator SLIM model photo is here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/915382685/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc

Lin

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> This is a good VGA: 250MHz to 4GHz, Dual 22dB each.
> http://www.maxim-ic.com/datasheet/index.mvp/id/6573
> Less than $6 if you buy from digikey.
> http://search.digikey.com/scripts/DkSearch/dksus.dll?lang=en&site=us&KeyWords=max19790
>
> 250MHz to 4000MHz RF Frequency Range
> Integrates Two Analog Attenuators in One Monolithic Device
> Flexible Attenuation-Control Ranges
> 22dB (per Attenuator)
> 44dB (Both Attenuators Cascaded)
> 2.4dB 1500MHz Insertion Loss (per Attenuator)
> Linear dB/V Analog Control Response Curve Simplifies Automatic Leveling Control and Gain-Trim Algorithms
> Excellent Attenuation Flatness Over Wide Frequency Ranges and Attenuation Settings
> Low 7.3mA Supply Current
> Single +5.0V Supply Voltage
>
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could manipulate the control voltage (derived from the log detector output) so that it would be somewhere between 2.5 and 5 V when the MSA input signals are weak and a very steady value somewhere between 0.5 V and 1 V when the input reaches a level where no amplification is needed any more.
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> > The attenuation curve has a bit of wiggle, but if the attenuation became fixed above a certain input level, any error caused by the wiggle would not mean much since it would only affect low level signals (-105 dBm vs. -105.3 dBm is no big deal), or you could simply calibrate at small intervals.
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> > They don't show the effect of temperature on attenuation but they do show the effect on individual diode resistance. It seems reasonably small, especially if you are at normal room temperature or above, as the inside of the MSA would normally be.
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> > > http://www.avagotech.com/docs/AV02-1962EN
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> > > >
> > > > As we only working at 1013.3MHz, it may not be a difficult work to construct a PIN attenuator. Or can find a product:
> > > > http://www.rflambda.com/pdf/voltageattenuator/RFVAT0102A30.pdf
> > > >
> > > > DIY tutorial:
> > > > http://palgong.kyungpook.ac.kr/~ysyoon/Pdf/an1048.pdf
> > > > http://www.odyseus.nildram.co.uk/RFMicrowave_Circuits_Files/Attenuator.pdf
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> > > > > > Here is how I calculated: The overall NF=16dB, overall gain 29. The noise floor at log detector input: -174 +16 + 29 + 30 = -99dBm. Log detector minimum input level is around -99dBm, at that area is very non-linear. However, starting from -91dBm to +15dBm, log detector has very good linearity, therefore, if we map -91dBm back to MSA input with the 29dB gain, the signal level will be -91-29=-120dBm. That does not say if we input -128dBm the log detecto won't reponse. becasue if we input -128 at MSA input, with the 29dB gain, the signal will show up at log detector as -99dBm, which is within log detector response range.
> > > > > >
> > > > > > Lin
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> > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > > > > > > If you have a regular need to view lower signals, I think the way to go is to increase the amp gain and use a "manually-controlled attenuator"--i.e insert one when necessary to see high level signals.
> > > > > > > If you rarely need the low levels, you can leave the internal amp at 7 dB, or even leave it out, but add an external amp when necessary.
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> > > > > > > There is a little-known feature of the software called Front End Compensation, where you can specify a front end that you have added (such as an amp or attenuator) and it will use a calibration file to adjust the readings. You can use the MSA to create the calibration file. This is only needed for SA mode, since in VNA modes the regular operating calibration takes care of the front end.
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> > > > > > > Adding attenuators or amps to the input is a way of shifting but not increasing the "simultaneous dynamic range". But it seems to me that if you get that range to 120 dB, the ability to shift it up or down with an attenuator or amp is all you are likely to need. If you have a 20 dB amp for getting to low signals, and a 20 dB attenuator (or maybe a couple), you'll be able to reach everything you want to reach.
> > > > > > >
> > > > > > > One might even say that the pre-cavity amp is not all that necessary. I was just compulsive about getting a solid -120 to 0 dB range. Plus, I wanted to get an idea what type of range I would get with the SAW module, which I expect will come out in the

ballpark of what I get with the pre-cavity amp.
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> > > > > > > >
> > > > > > > > For 0dBm input: 3dB pad+ mixer1+ VGA1=10dB + cavity + mixer 2+ VGA2 =0dB +
IFA2 + RBW. The log detector will see power around 0dBm.
> > > > > > > > For -120 dBm input: VGA1= 20dB, and VGA2=20dB.
> > > > > > > >
> > > > > > > > To not overload the VGA1, we may put noise filter in front of VGA1 (worst
case we can put two cavity filters).
> > > > > > > >
> > > > > > > > The VGA may not be a real VGA, it could be a ERA-33+ Voltage controlled
attenuator, if we can find one.
> > > > > > > >
> > > > > > > > If we extend this concept, we can put a voltage controlled attenuator at
Mixer1 input. That would extend the dynamic range to +20dBm to -120dBm.
> > > > > > > >
> > > > > > > > Lin
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> > > > > > > > Actually, you can let signals get to the VGA but not the log detector as
long as the max gain of the VGA won't allow it to be overloaded by such stray signals. One
way to make use of this would be to put a second VGA in front of the RBW filters. The IF2
amp might still be required, but with reduced gain--just enough to keep the noise level
down. The second VGA could tie into the same control line as the first, and would have to
have its gain limited to 20 dB or so to avoid the possibility of overload.
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reasonably low noise VGA that operates at >1 GHz, and has enough range not to be
overloaded, may be a challenge.
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> > > > > > > > A fundamental limitation of the VGA+log detector concept is that you
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Otherwise, a strong signal can overload the VGA without the log detector knowing about it.
That is the reason I use the arrangement RBW Filters->VGA->Noise Filter->log detector, with
the Noise Filter always broader bandwidth than the RBW filter.
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> > > > > > > > > > You actually could violate this rule for VNA use only, as long as there would never be a spurious signal strong enough to overload the VGA. That might be the case with a VGA located after the cavity filter (maybe even before the cavity) as long as the VGA never had gain greater than 30 dB or so. (The prime overload risk would come from leaked LO1.)
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> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > Sam
> > > > > > > > > > > If we can find a VGA working at 1013.3MHz, we might be able to apply the similar concept of the expended log detector on cavity filter amplifier. i.e. the gain is controlled with the log detector output, at hihger power input, the gain dropes more and at lower power the gain increases more. In this way, we can have larger dynamic range. The overall is a IF amplifer at 1013.3MHz but the BW is determined by the RBW filters.
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> > > > > > > > > > >
> > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
> > > > > > > > > > > >
> > > > > > > > > > > > How is the response at +21.4?
> > > > > > > > > > >
> > > > > > > > > > > > Jim, W1JGH
> > > > > > > > > > >
> > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > > > > > >
> > > > > > > > > > > > I have now actually installed an amp in front of my cavity filter (ERA-33 attenuated down to 7 dB gain). I'm guessing the performance of this with the cavity filter will be similar to the performance of the SAW module with its internal amp.
> > > > > > > > > > >
> > > > > > > > > > > > I recalibrated, though my calibration is not extremely precise because I did it with my MSA upside down with the bottom off and the fan not running, so it was never at thermal equilibrium.
> > > > > > > > > > >
> > > > > > > > > > > > My minimum visible signal with 600 kHz RBW is -122 dBm. My goal was to get a stable signal at -120 dBm. Such signal is now very visible, and if I place a marker on it, the value varies (noise) from scan to scan by about 2 dB. As far as I am concerned, that is excellent accuracy for such a low level signal. I can actually get a measurable response below -128 dBm, but if the ADC change per dB is too small, a small bit of noise creates a very erratic graph. So I calibrated down to -128 dBm, but I don't expect much accuracy under -120 dBm.
> > > > > > > > > > >
> > > > > > > > > > > > On the high end, I was aiming for useable but not great response at 0 dBm. I get very strong response at -5 dBm and decent response at 0 dBm, and was able to calibrate to 6 dBm with the ADC values still increasing a useful amount.
> > > > > > > > > > >
> > > > > > > > > > > > This is all in my 600 Hz RBW path. For wider paths, I lose a couple dB at the high end and varying amounts on the low end.

> > > > > > > > > > > > >
> > > > > > > > > > > > > > In summary, I have a solid response from -120 dBm to 0 dBm, with at least 5 dB of lesser response added on to each end.
> > > > > > > > > > > > >
> > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > >
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9087. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-27 16:56:46 UTC
From: Sam
Topic: 9018 Message: 9087

Lin,
That does solve the saturation problem nicely. Mine does not encounter that saturation, and maybe it has to do with a change I made as an experiment, which I didn't think had much effect but maybe it did affect the saturation point.

Referring to the current schematic, my Rx was replaced by a 0.1 uF capacitor, and my R2 is 6.8k rather than 10k.

Also, what noise filter are you using?

It might be helpful to identify where the saturation is occurring. With the input level near the point of saturation, check the RF levels at the IF2 amp input and output, and the VGA input and output.

It may partly be a matter of my MSA having higher losses in the initial stages.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> The high power performance can be improved with the PIN attenautor.
> I createded a PIN attenuator and attached it at a 20dB amplifer to be the pre-cavity amp. The PIN attenuator range is about -12dB to -32dB,test result is here:
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1951922862/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
> It shows that the dynamic range is -120 to +5dBm with 7.5kHZ RBW fitler. With 1kHz RBW filter, it would be -128 to +5dBm.
> The curve was measured on a MSA model with your expended log detector. The measurement step is 1dB between -125 to -100dBm, -10 to +5dBm; and 5dB step betwee -100 to -10dBm.
> Form the curve, we can see, if we do not put this PIN atten, -8dBm to 0dBm can not be used on my model, the curve goes down if we zoom in.
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/855170073/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
>
> The PIN attenuator SLIM model photo is here:
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/915382685/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
>
> Lin
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> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > This is a good VGA: 250MHz to 4GHz, Dual 22dB each.
> > http://www.maxim-ic.com/datasheet/index.mvp/id/6573
> > Less than $6 if you buy from digikey.

> > http://search.digikey.com/scripts/DkSearch/dksus.dll?lang=en&site=us&KeyWords=max19790
> >
> > 250MHz to 4000MHz RF Frequency Range
> > Integrates Two Analog Attenuators in One Monolithic Device
> > Flexible Attenuation-Control Ranges
> > 22dB (per Attenuator)
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> > > > > DIY tutorial:
> > > > > http://palgong.kyungpook.ac.kr/~ysyoon/Pdf/an1048.pdf

> > > > > http://www.odyseus.nildram.co.uk/RFMicrowave_Circuits_Files/Attenuator.pdf
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> > > > > > > > For -120 dBm input: VGA1= 20dB, and VGA2=20dB.
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> > > > > > > > > >
> > > > > > > > > > Jim, W1JGH

> > > > > > > > > > > > >
> > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@>
wrote:
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > I have now actually installed an amp in front of my cavity
filter (ERA-33 attenuated down to 7 dB gain). I'm guessing the performance of this with the
cavity filter will be similar to the performance of the SAW module with its internal amp.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > I recalibrated, though my calibration is not extremely precise
because I did it with my MSA upside down with the bottom off and the fan not running, so it
was never at thermal equilibrium.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > My minimum visible signal with 600 kHz RBW is -122 dBm. My goal
was to get a stable signal at -120 dBm. Such signal is now very visible, and if I place a
marker on it, the value varies (noise) from scan to scan by about 2 dB. As far as I am
concerned, that is excellent accuracy for such a low level signal. I can actually get a
measurable response below -128 dBm, but if the ADC change per dB is too small, a small bit
of noise creates a very erratic graph. So I calibrated down to -128 dBm, but I don't expect
much accuracy under -120 dBm.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > On the high end, I was aiming for useable but not great
response at 0 dBm. I get very strong response at -5 dBm and decent response at 0 dBm, and
was able to calibrate to 6 dBm with the ADC values still increasing a useful amount.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > This is all in my 600 Hz RBW path. For wider paths, I lose a
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> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > In summary, I have a solid response from -120 dBm to 0 dBm,
with at least 5 dB of lesser response added on to each end.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > >
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9088. Re: [spectrumanalyzer] Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-27 17:14:45 UTC
From: Jurgen
Topic: 9018 Message: 9088

Lin, do you have a schematic for this PIN attenuator?

Jurgen

On 12/27/2011 10:21 AM, inlinebeginner wrote:
>
> Sam
> The high power performance can be improved with the PIN attenautor.
> I createded a PIN attenuator and attached it at a 20dB amplifer to be
> the pre-cavity amp. The PIN attenuator range is about -12dB to
> -32dB,test result is here:
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1951922862/vie
w?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
> <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1951922862/vi
ew?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc>
> It shows that the dynamic range is -120 to +5dBm with 7.5kHZ RBW
> fitler. With 1kHz RBW filter, it would be -128 to +5dBm.
> The curve was measured on a MSA model with your expended log detector.
> The measurement step is 1dB between -125 to -100dBm, -10 to +5dBm; and
> 5dB step betwee -100 to -10dBm.
> Form the curve, we can see, if we do not put this PIN atten, -8dBm to
> 0dBm can not be used on my model, the curve goes down if we zoom in.
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/855170073/view
?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
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>
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner"
> <inlinebeginner@...> wrote:
> >
> > This is a good VGA: 250MHz to 4GHz, Dual 22dB each.
> > http://www.maxim-ic.com/datasheet/index.mvp/id/6573
> > Less than $6 if you buy from digikey.
> >
> http://search.digikey.com/scripts/DkSearch/dksus.dll?lang=en&site=us&KeyWords=max19790
> <http://search.digikey.com/scripts/DkSearch/dksus.dll?lang=en&site=us&KeyWords=max19790>

> >
> > 250MHz to 4000MHz RF Frequency Range
> > Integrates Two Analog Attenuators in One Monolithic Device
> > Flexible Attenuation-Control Ranges
> > 22dB (per Attenuator)
> > 44dB (Both Attenuators Cascaded)
> > 2.4dB 1500MHz Insertion Loss (per Attenuator)
> > Linear dB/V Analog Control Response Curve Simplifies Automatic
> Leveling Control and Gain-Trim Algorithms
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> > Single +5.0V Supply Voltage
> >
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
> > >
> > > Lin,
> > > Not bad for $1.71. That would work well if you used it preceding a
> 20-30 dB amp and could manipulate the control voltage (derived from
> the log detector output) so that it would be somewhere between 2.5 and
> 5 V when the MSA input signals are weak and a very steady value
> somewhere between 0.5 V and 1 V when the input reaches a level where
> no amplification is needed any more.
> > >
> > > The attenuation curve has a bit of wiggle, but if the attenuation
> became fixed above a certain input level, any error caused by the
> wiggle would not mean much since it would only affect low level
> signals (-105 dBm vs. -105.3 dBm is no big deal), or you could simply
> calibrate at small intervals.
> > >
> > > They don't show the effect of temperature on attenuation but they
> do show the effect on individual diode resistance. It seems reasonably
> small, especially if you are at normal room temperature or above, as
> the inside of the MSA would normally be.
> > >
> > > Sam W.
> > >
> > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner"
> <inlinebeginner@> wrote:
> > > >
> > > > with a OPAM inverter, HSMP-3866 may work.
> > > > http://www.avagotech.com/docs/AV02-1962EN
> > > > Lin
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner"

> <inlinebeginner@> wrote:
> > > > >
> > > > > As we only working at 1013.3MHz, it may not be a difficult
> work to construct a PIN attenuator. Or can find a product:
> > > > > http://www.rflambda.com/pdf/voltageattenuator/RFVAT0102A30.pdf
> > > > >
> > > > > DIY tutorial:
> > > > > http://palgong.kyungpook.ac.kr/~ysyoon/Pdf/an1048.pdf
> <http://palgong.kyungpook.ac.kr/%7Eysyoon/Pdf/an1048.pdf>
> > > > >
> http://www.odyseus.nildram.co.uk/RFMicrowave_Circuits_Files/Attenuator.pdf
> > > > >
> > > > > Lin
> > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
> > > > > >
> > > > > > It can all work as long as you don't overload anything along
> the way. A VGA immediately before or after the cavity filter would
> have to be able to handle inputs of at least -15 or -20 dBm along with
> the desired signal without becoming saturated in order to work well in
> SA mode. And have low noise. As a practical matter, I suspect you
> would need a small fixed gain low-noise amp followed by a VGA in order
> to minimize the effects of VGA noise.
> > > > > >
> > > > > > The expanded log detector was intended to be linear-in-db
> over as broad a range as possible, but because of our path calibration
> this linearity is not actually critical for the MSA. Any
> voltage-controlled mechanism would work that has high gain at low
> inputs and drops the gain at higher inputs, as long as the drop is not
> so abrupt as to require calibration at fine intervals. If would even
> be fine for the gain to hit its minimum at fairly low input levels,
> such as -90 dBm. Something as simple as a PIN diode attenuator could
> work, if it has reasonable temperature stability.
> > > > > >
> > > > > > Sam W.
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner"
> <inlinebeginner@> wrote:
> > > > > > >
> > > > > > > Sam
> > > > > > > My calculation is very conservitive. The -120dBm input is
> map to the linear area -90dBm of log detector, and the noise floor of
> log detector is around -100dBm. i.e. the 120dBm is very decent
> measurement. If we just want to identify the signal above the noise
> floor, the calculated signal leve at MSA input should be around -128
> dBm. Also, I use 1kHz RBW filter in my calculation, not 600Hz, the log
> detector is also the original Scotty's log detector, not the expended
> log detector. Your expended log detector actually contains one VGA
> already.

> > > > > > > Here is how I calculated: The overall NF=16dB, overall
> gain 29. The noise floor at log detector input: -174 +16 + 29 + 30 =
> -99dBm. Log detector minimum input level is around -99dBm, at that
> area is very non-linear. However, starting from -91dBm to +15dBm, log
> detector has very good linearity, therefore, if we map -91dBm back to
> MSA input with the 29dB gain, the signal level will be -91-29=-120dBm.
> That does not say if we input -128dBm the log detecto won't reponse.
> becasue if we input -128 at MSA input, with the 29dB gain, the signal
> will show up at log detector as -99dBm, which is within log detector
> response range.
> > > > > > >
> > > > > > > Lin
> > > > > > >
> > > > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
> > > > > > > >
> > > > > > > > Lin,
> > > > > > > > I'm getting -120 dBm to 0 dBm now, with a fixed 7 dB amp
> rather than your VGA1.
> > > > > > > >
> > > > > > > > If you have a regular need to view lower signals, I
> think the way to go is to increase the amp gain and use a
> "manually-controlled attenuator"--i.e insert one when necessary to see
> high level signals.
> > > > > > > > If you rarely need the low levels, you can leave the
> internal amp at 7 dB, or even leave it out, but add an external amp
> when necessary.
> > > > > > > >
> > > > > > > > There is a little-known feature of the software called
> Front End Compensation, where you can specify a front end that you
> have added (such as an amp or attenuator) and it will use a
> calibration file to adjust the readings. You can use the MSA to create
> the calibration file. This is only needed for SA mode, since in VNA
> modes the regular operating calibration takes care of the front end.
> > > > > > > >
> > > > > > > > Adding attenuators or amps to the input is a way of
> shifting but not increasing the "simultaneous dynamic range". But it
> seems to me that if you get that range to 120 dB, the ability to shift
> it up or down with an attenuator or amp is all you are likely to need.
> If you have a 20 dB amp for getting to low signals, and a 20 dB
> attenuator (or maybe a couple), you'll be able to reach everything you
> want to reach.
> > > > > > > >
> > > > > > > > One might even say that the pre-cavity amp is not all
> that necessary. I was just compulsive about getting a solid -120 to 0
> dB range. Plus, I wanted to get an idea what type of range I would get
> with the SAW module, which I expect will come out in the ballpark of
> what I get with the pre-cavity amp.
> > > > > > > >
> > > > > > > > Sam W.

> > > > > > > >
> > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner"
> <inlinebeginner@> wrote:
> > > > > > > > >
> > > > > > > > > > Sam
> > > > > > > > > > This is what I was calculating this morning. Here is
> what I got:
> > > > > > > > > > The MSA could have range: 0 dBm to -120dBm, with the
> following VGA config:
> > > > > > > > >
> > > > > > > > > > For 0dBm input: 3dB pad+ mixer1+ VGA1=10dB + cavity +
> mixer 2+ VGA2 =0dB + IFA2 + RBW. The log detector will see power
> around 0dBm.
> > > > > > > > > > For -120 dBm input: VGA1= 20dB, and VGA2=20dB.
> > > > > > > > >
> > > > > > > > > > To not overload the VGA1, we may put noise filter in
> front of VGA1 (worst case we can put two cavity filters).
> > > > > > > > >
> > > > > > > > > > The VGA may not be a real VGA, it could be a ERA-33+
> Voltage controlled attenuator, if we can find one.
> > > > > > > > >
> > > > > > > > > > If we extend this concept, we can put a voltage
> controlled attenuator at Mixer1 input. That would extend the dynamic
> range to +20dBm to -120dBm.
> > > > > > > > >
> > > > > > > > > > Lin
> > > > > > > > >
> > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
> > > > > > > > > >
> > > > > > > > > > Lin,
> > > > > > > > > > Actually, you can let signals get to the VGA but not
> the log detector as long as the max gain of the VGA won't allow it to
> be overloaded by such stray signals. One way to make use of this would
> be to put a second VGA in front of the RBW filters. The IF2 amp might
> still be required, but with reduced gain--just enough to keep the
> noise level down. The second VGA could tie into the same control line
> as the first, and would have to have its gain limited to 20 dB or so
> to avoid the possibility of overload.
> > > > > > > > >
> > > > > > > > > > You could do the same thing at the cavity filter,
> but finding a reasonably low noise VGA that operates at >1 GHz, and
> has enough range not to be overloaded, may be a challenge.
> > > > > > > > >
> > > > > > > > > > Sam W.
> > > > > > > > >
> > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
> > > > > > > > > >

> > > > > > > > > > > Lin,
> > > > > > > > > > > > A fundamental limitation of the VGA+log detector
> concept is that you can't allow signals to reach the VGA unless they
> will also reach the log detector. Otherwise, a strong signal can
> overload the VGA without the log detector knowing about it. That is
> the reason I use the arrangement RBW Filters->VGA->Noise Filter->log
> detector, with the Noise Filter always broader bandwidth than the RBW
> filter.
> > > > > > > > > > >
> > > > > > > > > > > > You actually could violate this rule for VNA use
> only, as long as there would never be a spurious signal strong enough
> to overload the VGA. That might be the case with a VGA located after
> the cavity filter (maybe even before the cavity) as long as the VGA
> never had gain greater than 30 dB or so. (The prime overload risk
> would come from leaked LO1.)
> > > > > > > > > > >
> > > > > > > > > > > > Sam W.
> > > > > > > > > > >
> > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner"
> <inlinebeginner@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > > Sam
> > > > > > > > > > > > If we can find a VGA working at 1013.3MHz, we
> might be able to apply the similar concept of the expended log
> detector on cavity filter amplifier. i.e. the gain is controlled with
> the log detector output, at hihger power input, the gain dropes more
> and at lower power the gain increases more. In this way, we can have
> larger dynamic range. The overall is a IF amplifer at 1013.3MHz but
> the BW is determined by the RBW filters.
> > > > > > > > > > > Lin
> > > > > > > > > > >
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "jghbeta" <jghalpha@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > > How is the response at +21.4?
> > > > > > > > > > >
> > > > > > > > > > > > Jim, W1JGH
> > > > > > > > > > >
> > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
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> > > > > > > > > > > > I have now actually installed an amp in
> front of my cavity filter (ERA-33 attenuated down to 7 dB gain). I'm
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> extremely precise because I did it with my MSA upside down with the

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> equilibrium.
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> > > > > > > > > > > > > > My minimum visible signal with 600 kHz RBW
> is -122 dBm. My goal was to get a stable signal at -120 dBm. Such
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9089. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-27 18:46:38 UTC
From: inlinebeginner
Topic: 9018 Message: 9089

Jurgen
I will publish it as soon as I finalize it and will tell you at that time. If you want to try a preliminary version (most likely is the final version, I did not see any layout errors, currently, I am working on part list), I can eamil you.
Lin

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> Lin, do you have a schematic for this PIN attenuator?
>
> Jurgen
>
>
>
> On 12/27/2011 10:21 AM, inlinebeginner wrote:
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> > Sam
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> > I createded a PIN attenuator and attached it at a 20dB amplifer to be
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> > Form the curve, we can see, if we do not put this PIN atten, -8dBm to
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> >
> > Lin
> >

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> > <inlinebeginner@> wrote:
> > >
> > > This is a good VGA: 250MHz to 4GHz, Dual 22dB each.
> > > http://www.maxim-ic.com/datasheet/index.mvp/id/6573
> > > Less than $6 if you buy from digikey.
> > >
> > http://search.digikey.com/scripts/DkSearch/dksus.dll?lang=en&site=us&KeyWords=max19790
> >
<http://search.digikey.com/scripts/DkSearch/dksus.dll?lang=en&site=us&KeyWords=max19790>
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> > >
> > > Lin
> > >
> > > --- In spectrumanalyzer@yahoogroups.com
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> > > > Not bad for $1.71. That would work well if you used it preceding a
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> > the log detector output) so that it would be somewhere between 2.5 and
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> > the inside of the MSA would normally be.
> > > >
> > > > Sam W.

> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner"
> > <inlinebeginner@> wrote:
> > > > >
> > > > > with a OPAM inverter, HSMP-3866 may work.
> > > > > http://www.avagotech.com/docs/AV02-1962EN
> > > > > Lin
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner"
> > <inlinebeginner@> wrote:
> > > > > >
> > > > > > As we only working at 1013.3MHz, it may not be a difficult
> > work to construct a PIN attenuator. Or can find a product:
> > > > > > http://www.rflambda.com/pdf/voltageattenuator/RFVAT0102A30.pdf
> > > > > >
> > > > > > DIY tutorial:
> > > > > > http://palgong.kyungpook.ac.kr/~ysyoon/Pdf/an1048.pdf
> > <http://palgong.kyungpook.ac.kr/%7Eysyoon/Pdf/an1048.pdf>
> > > > > >
> > http://www.odyseus.nildram.co.uk/RFMicrowave_Circuits_Files/Attenuator.pdf
> > > > > >
> > > > > > Lin
> > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
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> > > > > > > It can all work as long as you don't overload anything along
> > the way. A VGA immediately before or after the cavity filter would
> > have to be able to handle inputs of at least -15 or -20 dBm along with
> > the desired signal without becoming saturated in order to work well in
> > SA mode. And have low noise. As a practical matter, I suspect you
> > would need a small fixed gain low-noise amp followed by a VGA in order
> > to minimize the effects of VGA noise.
> > > > > > >
> > > > > > > The expanded log detector was intended to be linear-in-db
> > over as broad a range as possible, but because of our path calibration
> > this linearity is not actually critical for the MSA. Any
> > voltage-controlled mechanism would work that has high gain at low
> > inputs and drops the gain at higher inputs, as long as the drop is not
> > so abrupt as to require calibration at fine intervals. If would even
> > be fine for the gain to hit its minimum at fairly low input levels,
> > such as -90 dBm. Something as simple as a PIN diode attenuator could
> > work, if it has reasonable temperature stability.
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> > > > > > > Sam W.
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> > <mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner"
> > <inlinebeginner@> wrote:

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> > > > > > > > Sam
> > > > > > > > My calculation is very conservitive. The -120dBm input is
> > map to the linear area -90dBm of log detector, and the noise floor of
> > log detector is around -100dBm. i.e. the 120dBm is very decent
> > measurement. If we just want to identify the signal above the noise
> > floor, the calculated signal leve at MSA input should be around -128
> > dBm. Also, I use 1kHz RBW filter in my calculation, not 600Hz, the log
> > detector is also the original Scotty's log detector, not the expended
> > log detector. Your expended log detector actually contains one VGA
> > already.
> > > > > > > > Here is how I calculated: The overall NF=16dB, overall
> > gain 29. The noise floor at log detector input: -174 +16 + 29 + 30 =
> > -99dBm. Log detector minimum input level is around -99dBm, at that
> > area is very non-linear. However, starting from -91dBm to +15dBm, log
> > detector has very good linearity, therefore, if we map -91dBm back to
> > MSA input with the 29dB gain, the signal level will be -91-29=-120dBm.
> > That does not say if we input -128dBm the log detecto won't reponse.
> > becasue if we input -128 at MSA input, with the 29dB gain, the signal
> > will show up at log detector as -99dBm, which is within log detector
> > response range.
> > > > > > > >
> > > > > > > > Lin
> > > > > > > >
> > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
> > > > > > > > >
> > > > > > > > > Lin,
> > > > > > > > > I'm getting -120 dBm to 0 dBm now, with a fixed 7 dB amp
> > rather than your VGA1.
> > > > > > > > >
> > > > > > > > > If you have a regular need to view lower signals, I
> > think the way to go is to increase the amp gain and use a
> > "manually-controlled attenuator"--i.e insert one when necessary to see
> > high level signals.
> > > > > > > > > If you rarely need the low levels, you can leave the
> > internal amp at 7 dB, or even leave it out, but add an external amp
> > when necessary.
> > > > > > > > >
> > > > > > > > > There is a little-known feature of the software called
> > Front End Compensation, where you can specify a front end that you
> > have added (such as an amp or attenuator) and it will use a
> > calibration file to adjust the readings. You can use the MSA to create
> > the calibration file. This is only needed for SA mode, since in VNA
> > modes the regular operating calibration takes care of the front end.
> > > > > > > > >
> > > > > > > > > Adding attenuators or amps to the input is a way of
> > shifting but not increasing the "simultaneous dynamic range". But it
> > seems to me that if you get that range to 120 dB, the ability to shift
> > it up or down with an attenuator or amp is all you are likely to need.

> > If you have a 20 dB amp for getting to low signals, and a 20 dB
> > attenuator (or maybe a couple), you'll be able to reach everything you
> > want to reach.
> > > > > > > > >
> > > > > > > > > One might even say that the pre-cavity amp is not all
> > that necessary. I was just compulsive about getting a solid -120 to 0
> > dB range. Plus, I wanted to get an idea what type of range I would get
> > with the SAW module, which I expect will come out in the ballpark of
> > what I get with the pre-cavity amp.
> > > > > > > > > >
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> > > > > > > > > > > Sam
> > > > > > > > > > > This is what I was calculating this morning. Here is
> > what I got:
> > > > > > > > > > > The MSA could have range: 0 dBm to -120dBm, with the
> > following VGA config:
> > > > > > > > > >
> > > > > > > > > > > For 0dBm input: 3dB pad+ mixer1+ VGA1=10dB + cavity +
> > mixer 2+ VGA2 =0dB + IFA2 + RBW. The log detector will see power
> > around 0dBm.
> > > > > > > > > > > For -120 dBm input: VGA1= 20dB, and VGA2=20dB.
> > > > > > > > > >
> > > > > > > > > > > To not overload the VGA1, we may put noise filter in
> > front of VGA1 (worst case we can put two cavity filters).
> > > > > > > > > >
> > > > > > > > > > > The VGA may not be a real VGA, it could be a ERA-33+
> > Voltage controlled attenuator, if we can find one.
> > > > > > > > > >
> > > > > > > > > > > If we extend this concept, we can put a voltage
> > controlled attenuator at Mixer1 input. That would extend the dynamic
> > range to +20dBm to -120dBm.
> > > > > > > > > >
> > > > > > > > > > > Lin
> > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
> > > > > > > > > >
> > > > > > > > > > > Lin,
> > > > > > > > > > > Actually, you can let signals get to the VGA but not
> > the log detector as long as the max gain of the VGA won't allow it to
> > be overloaded by such stray signals. One way to make use of this would
> > be to put a second VGA in front of the RBW filters. The IF2 amp might
> > still be required, but with reduced gain--just enough to keep the
> > noise level down. The second VGA could tie into the same control line
> > as the first, and would have to have its gain limited to 20 dB or so

> > to avoid the possibility of overload.
> > > > > > > > > > >
> > > > > > > > > > > You could do the same thing at the cavity filter,
> > but finding a reasonably low noise VGA that operates at >1 GHz, and
> > has enough range not to be overloaded, may be a challenge.
> > > > > > > > > > >
> > > > > > > > > > > Sam W.
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > Lin,
> > > > > > > > > > > A fundamental limitation of the VGA+log detector
> > concept is that you can't allow signals to reach the VGA unless they
> > will also reach the log detector. Otherwise, a strong signal can
> > overload the VGA without the log detector knowing about it. That is
> > the reason I use the arrangement RBW Filters->VGA->Noise Filter->log
> > detector, with the Noise Filter always broader bandwidth than the RBW
> > filter.
> > > > > > > > > > >
> > > > > > > > > > > You actually could violate this rule for VNA use
> > only, as long as there would never be a spurious signal strong enough
> > to overload the VGA. That might be the case with a VGA located after
> > the cavity filter (maybe even before the cavity) as long as the VGA
> > never had gain greater than 30 dB or so. (The prime overload risk
> > would come from leaked LO1.)
> > > > > > > > > > >
> > > > > > > > > > > Sam W.
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "inlinebeginner"
> > <inlinebeginner@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > Sam
> > > > > > > > > > > If we can find a VGA working at 1013.3MHz, we
> > might be able to apply the similar concept of the expended log
> > detector on cavity filter amplifier. i.e. the gain is controlled with
> > the log detector output, at hihger power input, the gain dropes more
> > and at lower power the gain increases more. In this way, we can have
> > larger dynamic range. The overall is a IF amplifer at 1013.3MHz but
> > the BW is determined by the RBW filters.
> > > > > > > > > > > Lin
> > > > > > > > > > >
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "jghbeta" <jghalpha@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > How is the response at +21.4?
> > > > > > > > > > >
> > > > > > > > > > > Jim, W1JGH

> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, "Sam" <swetterlin@> wrote:
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > I have now actually installed an amp in
> > front of my cavity filter (ERA-33 attenuated down to 7 dB gain). I'm
> > guessing the performance of this with the cavity filter will be
> > similar to the performance of the SAW module with its internal amp.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > I recalibrated, though my calibration is not
> > extremely precise because I did it with my MSA upside down with the
> > bottom off and the fan not running, so it was never at thermal
> > equilibrium.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > My minimum visible signal with 600 kHz RBW
> > is -122 dBm. My goal was to get a stable signal at -120 dBm. Such
> > signal is now very visible, and if I place a marker on it, the value
> > varies (noise) from scan to scan by about 2 dB. As far as I am
> > concerned, that is excellent accuracy for such a low level signal. I
> > can actually get a measurable response below -128 dBm, but if the ADC
> > change per dB is too small, a small bit of noise creates a very
> > erratic graph. So I calibrated down to -128 dBm, but I don't expect
> > much accuracy under -120 dBm.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > On the high end, I was aiming for useable
> > but not great response at 0 dBm. I get very strong response at -5 dBm
> > and decent response at 0 dBm, and was able to calibrate to 6 dBm with
> > the ADC values still increasing a useful amount.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > This is all in my 600 Hz RBW path. For wider
> > paths, I lose a couple dB at the high end and varying amounts on the
> > low end.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > In summary, I have a solid response from
> > -120 dBm to 0 dBm, with at least 5 dB of lesser response added on to
> > each end.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > > > > >
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>

9090. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-27 18:50:51 UTC
From: inlinebeginner
Topic: 9018 Message: 9090

Sam
The IF2 Amp on my test model is not made of OP amp, it is emulated with one 13dB amplifier+ 6dB pad + 20dB amplifer (ERA-5). That might be the reason that I saw it was saturated at -8dBm.
Later I will check what you suggested.
Lin
--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> Lin,
> That does solve the saturation problem nicely. Mine does not encounter that saturation, and maybe it has to do with a change I made as an experiment, which I didn't think had much effect but maybe it did affect the saturation point.
>
> Referring to the current schematic, my Rx was replaced by a 0.1 uF capacitor, and my R2 is 6.8k rather than 10k.
>
> Also, what noise filter are you using?
>
> It might be helpful to identify where the saturation is occurring. With the input level near the point of saturation, check the RF levels at the IF2 amp input and output, and the VGA input and output.
>
> It may partly be a matter of my MSA having higher losses in the initial stages.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Sam
> > The high power performance can be improved with the PIN attenautor.
> > I createded a PIN attenuator and attached it at a 20dB amplifer to be the pre-cavity amp. The PIN attenuator range is about -12dB to -32dB,test result is here:
> > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1951922862/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
> > It shows that the dynamic range is -120 to +5dBm with 7.5kHZ RBW fitler. With 1kHz RBW filter, it would be -128 to +5dBm.
> > The curve was measured on a MSA model with your expended log detector. The measurement step is 1dB between -125 to -100dBm, -10 to +5dBm; and 5dB step betwee -100 to -10dBm.
> > Form the curve, we can see, if we do not put this PIN atten, -8dBm to 0dBm can not be used on my model, the curve goes down if we zoom in.
> > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/855170073/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
> >
> > The PIN attenuator SLIM model photo is here:
> > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/915382685/vi

ew?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
> >
> > Lin
> >
> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > >
> > > This is a good VGA: 250MHz to 4GHz, Dual 22dB each.
> > > http://www.maxim-ic.com/datasheet/index.mvp/id/6573
> > > Less than $6 if you buy from digikey.
> > >
http://search.digikey.com/scripts/DkSearch/dksus.dll?lang=en&site=us&KeyWords=max19790
> > >
> > > 250MHz to 4000MHz RF Frequency Range
> > > Integrates Two Analog Attenuators in One Monolithic Device
> > > Flexible Attenuation-Control Ranges
> > > 22dB (per Attenuator)
> > > 44dB (Both Attenuators Cascaded)
> > > 2.4dB 1500MHz Insertion Loss (per Attenuator)
> > > Linear dB/V Analog Control Response Curve Simplifies Automatic Leveling Control and
Gain-Trim Algorithms
> > > Excellent Attenuation Flatness Over Wide Frequency Ranges and Attenuation Settings
> > > Low 7.3mA Supply Current
> > > Single +5.0V Supply Voltage
> > >
> > > Lin
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > >
> > > > Lin,
> > > > Not bad for $1.71. That would work well if you used it preceding a 20-30 dB amp and
could manipulate the control voltage (derived from the log detector output) so that it
would be somewhere between 2.5 and 5 V when the MSA input signals are weak and a very
steady value somewhere between 0.5 V and 1 V when the input reaches a level where no
amplification is needed any more.
> > > >
> > > > The attenuation curve has a bit of wiggle, but if the attenuation became fixed
above a certain input level, any error caused by the wiggle would not mean much since it
would only affect low level signals (-105 dBm vs. -105.3 dBm is no big deal), or you could
simply calibrate at small intervals.
> > > >
> > > > They don't show the effect of temperature on attenuation but they do show the
effect on individual diode resistance. It seems reasonably small, especially if you are at
normal room temperature or above, as the inside of the MSA would normally be.
> > > >
> > > > Sam W.
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
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> > > > > with a OPAM inverter, HSMP-3866 may work.
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> > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@>
wrote:
> > > > > >
> > > > > > As we only working at 1013.3MHz, it may not be a difficult work to construct a
PIN attenuator. Or can find a product:
> > > > > > http://www.rflambda.com/pdf/voltageattenuator/RFVAT0102A30.pdf
> > > > > >
> > > > > > DIY tutorial:
> > > > > > http://palgong.kyungpook.ac.kr/~ysyoon/Pdf/an1048.pdf
> > > > > > http://www.odyseus.nildram.co.uk/RFMicrowave_Circuits_Files/Attenuator.pdf
> > > > > >
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> > > > > > > > Lin
> > > > > > > >
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> > > > > > > > >
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> > > > > > > > >
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> > > > > > > > > >
> > > > > > > > > > > If we extend this concept, we can put a voltage controlled attenuator at Mixer1 input. That would extend the dynamic range to +20dBm to -120dBm.
> > > > > > > > > >
> > > > > > > > > > > Lin
> > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > > Lin,
> > > > > > > > > > > > Actually, you can let signals get to the VGA but not the log detector as long as the max gain of the VGA won't allow it to be overloaded by such stray signals. One way to make use of this would be to put a second VGA in front of the RBW filters. The IF2 amp might still be required, but with reduced gain--just enough to keep the noise level down. The second VGA could tie into the same control line as the first, and would have to have its gain limited to 20 dB or so to avoid the possibility of overload.
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> > > > > > > > > > > > You could do the same thing at the cavity filter, but finding a reasonably low noise VGA that operates at >1 GHz, and has enough range not to be overloaded, may be a challenge.
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> > > > > > > > > > > > Sam W.
> > > > > > > > > >
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> > > > > > > > > > > > > Lin,
> > > > > > > > > > > > > A fundamental limitation of the VGA+log detector concept is that you can't allow signals to reach the VGA unless they will also reach the log detector. Otherwise, a strong signal can overload the VGA without the log detector knowing about it. That is the reason I use the arrangement RBW Filters->VGA->Noise Filter->log detector, with the Noise Filter always broader bandwidth than the RBW filter.
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> > > > > > > > > > > > > You actually could violate this rule for VNA use only, as long as there would never be a spurious signal strong enough to overload the VGA. That might be the case with a VGA located after the cavity filter (maybe even before the cavity) as long as the VGA never had gain greater than 30 dB or so. (The prime overload risk would come from leaked LO1.)
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> > > > > > > > > > > > > > If we can find a VGA working at 1013.3MHz, we might be able to apply the similar concept of the expended log detector on cavity filter amplifier. i.e. the gain is controlled with the log detector output, at hihger power input, the gain dropes more and at lower power the gain increases more. In this way, we can have larger dynamic range. The overall is a IF amplifer at 1013.3MHz but the BW is determined by the RBW filters.
> > > > > > > > > > > > Lin

> > > > > > > > > > > > >
> > > > > > > > > > > > >
> > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@>
wrote:
> > > > > > > > > > > > >
> > > > > > > > > > > > > How is the response at +21.4?
> > > > > > > > > > > > >
> > > > > > > > > > > > > Jim, W1JGH
> > > > > > > > > > > > >
> > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@>
wrote:
> > > > > > > > > > > > >
> > > > > > > > > > > > > I have now actually installed an amp in front of my cavity
filter (ERA-33 attenuated down to 7 dB gain). I'm guessing the performance of this with the
cavity filter will be similar to the performance of the SAW module with its internal amp.
> > > > > > > > > > > > >
> > > > > > > > > > > > > I recalibrated, though my calibration is not extremely
precise because I did it with my MSA upside down with the bottom off and the fan not
running, so it was never at thermal equilibrium.
> > > > > > > > > > > > >
> > > > > > > > > > > > > My minimum visible signal with 600 kHz RBW is -122 dBm. My
goal was to get a stable signal at -120 dBm. Such signal is now very visible, and if I
place a marker on it, the value varies (noise) from scan to scan by about 2 dB. As far as I
am concerned, that is excellent accuracy for such a low level signal. I can actually get a
measurable response below -128 dBm, but if the ADC change per dB is too small, a small bit
of noise creates a very erratic graph. So I calibrated down to -128 dBm, but I don't expect
much accuracy under -120 dBm.
> > > > > > > > > > > > >
> > > > > > > > > > > > > On the high end, I was aiming for useable but not great
response at 0 dBm. I get very strong response at -5 dBm and decent response at 0 dBm, and
was able to calibrate to 6 dBm with the ADC values still increasing a useful amount.
> > > > > > > > > > > > >
> > > > > > > > > > > > > This is all in my 600 Hz RBW path. For wider paths, I lose a
couple dB at the high end and varying amounts on the low end.
> > > > > > > > > > > > >
> > > > > > > > > > > > > In summary, I have a solid response from -120 dBm to 0 dBm,
with at least 5 dB of lesser response added on to each end.
> > > > > > > > > > > > >
> > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > >
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9091. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-27 19:28:40 UTC
From: inlinebeginner
Topic: 9018 Message: 9091

Sam
The RBW filter I was using is 7.5kHz. My 1kHz RBW filter is centered at 10.111MHz, it will not work with a 10.7MHz 200kHz BW noise filter. I plan to build a 10.695MHz 1kHz BW filter recently.
With 1kHz filter, we would have -128dBm to +5dBm dynamic range.
By the way, the cavity filter I was using is the recent built, it has only 4.2dB insertion loss, that might be another factor that I saw saturation but you did not see.
Lin

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> The IF2 Amp on my test model is not made of OP amp, it is emulated with one 13dB amplifier+ 6dB pad + 20dB amplifer (ERA-5). That might be the reason that I saw it was saturated at -8dBm.
> Later I will check what you suggested.
> Lin
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > Lin,
> > That does solve the saturation problem nicely. Mine does not encounter that saturation, and maybe it has to do with a change I made as an experiment, which I didn't think had much effect but maybe it did affect the saturation point.
> >
> > Referring to the current schematic, my Rx was replaced by a 0.1 uF capacitor, and my R2 is 6.8k rather than 10k.
> >
> > Also, what noise filter are you using?
> >
> > It might be helpful to identify where the saturation is occurring. With the input level near the point of saturation, check the RF levels at the IF2 amp input and output, and the VGA input and output.
> >
> > It may partly be a matter of my MSA having higher losses in the initial stages.
> >
> > Sam W.
> >
> > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > >
> > > Sam
> > > The high power performance can be improved with the PIN attenautor.
> > > I createded a PIN attenuator and attached it at a 20dB amplifer to be the pre-cavity amp. The PIN attenuator range is about -12dB to -32dB,test result is here:
> > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1951922862/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc

> > > It shows that the dynamic range is -120 to +5dBm with 7.5kHZ RBW fitler. With 1kHz RBW filter, it would be -128 to +5dBm.
> > > The curve was measured on a MSA model with your expended log detector. The measurement step is 1dB between -125 to -100dBm, -10 to +5dBm; and 5dB step betwee -100 to -10dBm.
> > > Form the curve, we can see, if we do not put this PIN atten, -8dBm to 0dBm can not be used on my model, the curve goes down if we zoom in.
> > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/855170073/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
> > >
> > > The PIN attenuator SLIM model photo is here:
> > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/915382685/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
> > >
> > > Lin
> > >
> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > >
> > > > This is a good VGA: 250MHz to 4GHz, Dual 22dB each.
> > > > http://www.maxim-ic.com/datasheet/index.mvp/id/6573
> > > > Less than $6 if you buy from digikey.
> > > >
http://search.digikey.com/scripts/DkSearch/dksus.dll?lang=en&site=us&KeyWords=max19790
> > > >
> > > > 250MHz to 4000MHz RF Frequency Range
> > > > Integrates Two Analog Attenuators in One Monolithic Device
> > > > Flexible Attenuation-Control Ranges
> > > > 22dB (per Attenuator)
> > > > 44dB (Both Attenuators Cascaded)
> > > > 2.4dB 1500MHz Insertion Loss (per Attenuator)
> > > > Linear dB/V Analog Control Response Curve Simplifies Automatic Leveling Control and Gain-Trim Algorithms
> > > > Excellent Attenuation Flatness Over Wide Frequency Ranges and Attenuation Settings
> > > > Low 7.3mA Supply Current
> > > > Single +5.0V Supply Voltage
> > > >
> > > > Lin
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > >
> > > > > Lin,
> > > > > Not bad for $1.71. That would work well if you used it preceding a 20-30 dB amp and could manipulate the control voltage (derived from the log detector output) so that it would be somewhere between 2.5 and 5 V when the MSA input signals are weak and a very steady value somewhere between 0.5 V and 1 V when the input reaches a level where no amplification is needed any more.
> > > > >
> > > > > The attenuation curve has a bit of wiggle, but if the attenuation became fixed above a certain input level, any error caused by the wiggle would not mean much since it would only affect low level signals (-105 dBm vs. -105.3 dBm is no big deal), or you could

simply calibrate at small intervals.
> > > > >
> > > > > They don't show the effect of temperature on attenuation but they do show the effect on individual diode resistance. It seems reasonably small, especially if you are at normal room temperature or above, as the inside of the MSA would normally be.
> > > > >
> > > > > Sam W.
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > >
> > > > > > with a OPAM inverter, HSMP-3866 may work.
> > > > > > http://www.avagotech.com/docs/AV02-1962EN
> > > > > > Lin
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > >
> > > > > > > As we only working at 1013.3MHz, it may not be a difficult work to construct a PIN attenuator. Or can find a product:
> > > > > > > http://www.rflambda.com/pdf/voltageattenuator/RFVAT0102A30.pdf
> > > > > > >
> > > > > > > DIY tutorial:
> > > > > > > http://palgong.kyungpook.ac.kr/~ysyoon/Pdf/an1048.pdf
> > > > > > > http://www.odyseus.nildram.co.uk/RFMicrowave_Circuits_Files/Attenuator.pdf
> > > > > > >
> > > > > > > Lin
> > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > >
> > > > > > > > It can all work as long as you don't overload anything along the way. A VGA immediately before or after the cavity filter would have to be able to handle inputs of at least -15 or -20 dBm along with the desired signal without becoming saturated in order to work well in SA mode. And have low noise. As a practical matter, I suspect you would need a small fixed gain low-noise amp followed by a VGA in order to minimize the effects of VGA noise.
> > > > > > >
> > > > > > > The expanded log detector was intended to be linear-in-db over as broad a range as possible, but because of our path calibration this linearity is not actually critical for the MSA. Any voltage-controlled mechanism would work that has high gain at low inputs and drops the gain at higher inputs, as long as the drop is not so abrupt as to require calibration at fine intervals. If would even be fine for the gain to hit its minimum at fairly low input levels, such as -90 dBm. Something as simple as a PIN diode attenuator could work, if it has reasonable temperature stability.
> > > > > > >
> > > > > > > Sam W.
> > > > > > >
> > > > > > > --- In spectrumanalyzer@...m, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > >
> > > > > > > > Sam
> > > > > > > > My calculation is very conservitive. The -120dBm input is map to the linear area -90dBm of log detector, and the noise floor of log detector is around -100dBm.

i.e. the 120dBm is very decent measurement. If we just want to identify the signal above the noise floor, the calculated signal leve at MSA input should be around -128 dBm. Also, I use 1kHz RBW filter in my calculation, not 600Hz, the log detector is also the original Scotty's log detector, not the expended log detector. Your expended log detector actually contains one VGA already.
> > > > > > > > > Here is how I calculated: The overall NF=16dB, overall gain 29. The noise floor at log detector input: -174 +16 + 29 + 30 = -99dBm. Log detector minimum input level is around -99dBm, at that area is very non-linear. However, starting from -91dBm to +15dBm, log detector has very good linearity, therefore, if we map -91dBm back to MSA input with the 29dB gain, the signal level will be -91-29=-120dBm. That does not say if we input -128dBm the log detecto won't reponse. becasue if we input -128 at MSA input, with the 29dB gain, the signal will show up at log detector as -99dBm, which is within log detector response range.
> > > > > > > > >
> > > > > > > > > Lin
> > > > > > > > >
> > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > > > >
> > > > > > > > > > Lin,
> > > > > > > > > > I'm getting -120 dBm to 0 dBm now, with a fixed 7 dB amp rather than your VGA1.
> > > > > > > > > >
> > > > > > > > > > If you have a regular need to view lower signals, I think the way to go is to increase the amp gain and use a "manually-controlled attenuator"--i.e insert one when necessary to see high level signals.
> > > > > > > > > > If you rarely need the low levels, you can leave the internal amp at 7 dB, or even leave it out, but add an external amp when necessary.
> > > > > > > > > >
> > > > > > > > > > There is a little-known feature of the software called Front End Compensation, where you can specify a front end that you have added (such as an amp or attenuator) and it will use a calibration file to adjust the readings. You can use the MSA to create the calibration file. This is only needed for SA mode, since in VNA modes the regular operating calibration takes care of the front end.
> > > > > > > > > >
> > > > > > > > > > Adding attenuators or amps to the input is a way of shifting but not increasing the "simultaneous dynamic range". But it seems to me that if you get that range to 120 dB, the ability to shift it up or down with an attenuator or amp is all you are likely to need. If you have a 20 dB amp for getting to low signals, and a 20 dB attenuator (or maybe a couple), you'll be able to reach everything you want to reach.
> > > > > > > > > >
> > > > > > > > > > One might even say that the pre-cavity amp is not all that necessary. I was just compulsive about getting a solid -120 to 0 dB range. Plus, I wanted to get an idea what type of range I would get with the SAW module, which I expect will come out in the ballpark of what I get with the pre-cavity amp.
> > > > > > > > > >
> > > > > > > > > > Sam W.
> > > > > > > > > >
> > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > > > >
> > > > > > > > > > Sam

> > > > > > > > > > > This is what I was calculating this morning. Here is what I got:
> > > > > > > > > > > The MSA could have range: 0 dBm to -120dBm, with the following VGA config:
> > > > > > > > > > >
> > > > > > > > > > > For 0dBm input: 3dB pad+ mixer1+ VGA1=10dB + cavity + mixer 2+ VGA2 =0dB + IFA2 + RBW. The log detector will see power around 0dBm.
> > > > > > > > > > > For -120 dBm input: VGA1= 20dB, and VGA2=20dB.
> > > > > > > > > > >
> > > > > > > > > > > To not overload the VGA1, we may put noise filter in front of VGA1 (worst case we can put two cavity filters).
> > > > > > > > > > >
> > > > > > > > > > > The VGA may not be a real VGA, it could be a ERA-33+ Voltage controlled attenuator, if we can find one.
> > > > > > > > > > >
> > > > > > > > > > > If we extend this concept, we can put a voltage controlled attenuator at Mixer1 input. That would extend the dynamic range to +20dBm to -120dBm.
> > > > > > > > > > >
> > > > > > > > > > > Lin
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
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> > > > > > > > > > > > > > Sam W.
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> > > > > > > > > > > > > > >
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> > > > > > > > > > > > > > > My minimum visible signal with 600 kHz RBW is -122 dBm. My goal was to get a stable signal at -120 dBm. Such signal is now very visible, and if I place a marker on it, the value varies (noise) from scan to scan by about 2 dB. As far as I am concerned, that is excellent accuracy for such a low level signal. I can actually get a measurable response below -128 dBm, but if the ADC change per dB is too small, a small bit of noise creates a very erratic graph. So I calibrated down to -128 dBm, but I don't expect much accuracy under -120 dBm.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > On the high end, I was aiming for useable but not great response at 0 dBm. I get very strong response at -5 dBm and decent response at 0 dBm, and was able to calibrate to 6 dBm with the ADC values still increasing a useful amount.
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> > > > > > > > > > > > > > > This is all in my 600 Hz RBW path. For wider paths, I lose a couple dB at the high end and varying amounts on the low end.
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > In summary, I have a solid response from -120 dBm to 0 dBm, with at least 5 dB of lesser response added on to each end.

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> > > > > > > > > > > > > > > > > > Sam W.
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9092. 9 coax filters built and shipped

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-28 09:05:07 UTC
From: spyker49
Topic: 9092 Message: 9092

Over the last week with some Santa's little helpers (a few beers) and the Australian Post Kangeroos, I shipped:

4 coax filters to France, 3 of these were kits.
Merci beaucoup mes amis de électronique. (Blame Yahoo translator).
2 coax filters to the USA. One at 1.0453 GHz.
1 coax filter to the UK.
2 coax filters to hot summer time OZ, Victoria and Queensland.
I hope that helps get your SAs fully operational.

That wraps up the coax filter batch production for another year.
Over the years 40 filters have been made. I always welcome feedback good or bad.

Built a 2x cavity filter for fun but have no reference unit plots. Any one with a 2x cavity plot or link please send it to me.

Regards Len Spyker

9093. NDK 10P7D filter response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-28 09:48:12 UTC
From: davidhooau
Topic: 9093 Message: 9093

Oh Wise Ones,

I've built an RBW filter using the NDK 10P7D which is readily available on EBay. A happy snap is here:

<http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>

Can anyone advise what the two "shoulders" 20kHz either side of the response might be?

Thanks,

davidh

9094. RE: [spectrumanalyzer] Re: Cavity filter construction (Len's soldering hints and secrets) 5 CAVITIES

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-28 11:18:13 UTC
From: F4CNY
Topic: 9053 Message: 9094

Hi Len,

Is it possible to have a 5x cavity ?
Is it too late perhaps ?
Answer via my email.

Thanks a lot.

Best regards,
Ennio
-----Message d'origine-----
De : spectrumanalyzer@yahoogroups.com
[mailto:spectrumanalyzer@yahoogroups.com]De la part de Len
Envoye : mardi 20 decembre 2011 08:52
A : spectrumanalyzer@yahoogroups.com
Objet : [spectrumanalyzer] Re: Cavity filter construction (Len's soldering hints and secrets) 5 CAVITIES
Importance : Haute

Re: Can I build five cavity filter?

I can do it, but ,maybe best to first ask our guru Scotty if he foresees any downs or even if there are any ups at all.

I would expect more attenuation another -2-3 db and perhaps steeper-complex phase shifts, ripples?

I was contemplating building a 1x and 2x filter for possible SAW projects.

So I could couple a current 4x and 1x proto and suck it and see.

I have qty 20 raw cut pipes and posts (spare) at the moment so no problem there.

Price of current 4x cavity = U$80 assembled and tested, so 5x cavity = U$100.

Postage for a 5x or 4x+1x may be a big price step the 4 x is 0.495 Kg just inside the OZ post office < 0.5Kg cheaper rate.

Regards

Len Spyker

9095. NDK 10P7D filter response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-28 11:48:39 UTC
From: Greg Broburg
Topic: 9093 Message: 9095

I would call them undesirable.

Regards;

Greg

> Oh Wise Ones,
>
> I've built an RBW filter using the NDK 10P7D which is readily
> available on EBay. A happy snap is here:
>
> <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc
> <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>>
>
> Can anyone advise what the two "shoulders" 20kHz either side of the
> response might be?
>
> Thanks,
>
> davidh
>>
>> Can anyone advise what the two "shoulders" 20kHz either side of the
>> response might be?
>>
>> Thanks,
>>
>> davidh
>>
>> ._,___

9096. Amp/Transformer group buy update

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-28 13:23:34 UTC
From: s.staines@cranfield.ac.uk
Topic: 9096 Message: 9096

The order has been placed; the given date for shipping is the 4th of Jan, will start mailing as soon as possible, jiffy are bags ready.
Regards
Steve g7was

9097. Re: NDK 10P7D filter response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-28 14:04:55 UTC
From: Sam
Topic: 9093 Message: 9097

David,
My guess is that they result from modulation in your LO1 resulting from ripple on the +20V line, and have nothing to do with the filter itself. Try putting another 10 uF cap on top of the one in PLO1 and do the same for the ones on the control board in the voltage doubler. Be sure to use X5R or X7R capacitors. You might have to do the same in PLO3 as well.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Oh Wise Ones,
>
> I've built an RBW filter using the NDK 10P7D which is readily available on EBay. A happy snap is here:
>
> <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>
>
> Can anyone advise what the two "shoulders" 20kHz either side of the response might be?
>
> Thanks,
>
> davidh
>

9098. Re: Pre-Cavity Amp

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-28 15:02:23 UTC
From: Sam
Topic: 9018 Message: 9098

Lin,
You might try adding a 6 dB attenuator at the IF2 amp output with and without the 7 dB pre-cavity amp. That might solve the saturation problem. It would likely worsen the low end noise, but yours seems extremely good for a 7.5 kHz RBW.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> The RBW filter I was using is 7.5kHz. My 1kHz RBW filter is centered at 10.111MHz, it will not work with a 10.7MHz 200kHz BW noise filter. I plan to build a 10.695MHz 1kHz BW filter recently.
> With 1kHz filter, we would have -128dBm to +5dBm dynamic range.
> By the way, the cavity filter I was using is the recent built, it has only 4.2dB insertion loss, that might be another factor that I saw saturation but you did not see.
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> >
> > Sam
> > The IF2 Amp on my test model is not made of OP amp, it is emulated with one 13dB amplifier+ 6dB pad + 20dB amplifer (ERA-5). That might be the reason that I saw it was saturated at -8dBm.
> > Later I will check what you suggested.
> > Lin
> > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > >
> > > Lin,
> > > That does solve the saturation problem nicely. Mine does not encounter that saturation, and maybe it has to do with a change I made as an experiment, which I didn't think had much effect but maybe it did affect the saturation point.
> > >
> > > Referring to the current schematic, my Rx was replaced by a 0.1 uF capacitor, and my R2 is 6.8k rather than 10k.
> > >
> > > Also, what noise filter are you using?
> > >
> > > It might be helpful to identify where the saturation is occurring. With the input level near the point of saturation, check the RF levels at the IF2 amp input and output, and the VGA input and output.
> > >
> > > It may partly be a matter of my MSA having higher losses in the initial stages.
> > >
> > > Sam W.
> > >

> > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > >
> > > > Sam
> > > > The high power performance can be improved with the PIN attenautor.
> > > > I createded a PIN attenuator and attached it at a 20dB amplifer to be the pre-cavity amp. The PIN attenuator range is about -12dB to -32dB,test result is here:
> > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/1951922862/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
> > > > It shows that the dynamic range is -120 to +5dBm with 7.5kHZ RBW fitler. With 1kHz RBW filter, it would be -128 to +5dBm.
> > > > The curve was measured on a MSA model with your expended log detector. The measurement step is 1dB between -125 to -100dBm, -10 to +5dBm; and 5dB step betwee -100 to -10dBm.
> > > > Form the curve, we can see, if we do not put this PIN atten, -8dBm to 0dBm can not be used on my model, the curve goes down if we zoom in.
> > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/855170073/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
> > > >
> > > > The PIN attenuator SLIM model photo is here:
> > > > http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/915382685/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
> > > >
> > > > Lin
> > > >
> > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > >
> > > > > This is a good VGA: 250MHz to 4GHz, Dual 22dB each.
> > > > > http://www.maxim-ic.com/datasheet/index.mvp/id/6573
> > > > > Less than $6 if you buy from digikey.
> > > > >
http://search.digikey.com/scripts/DkSearch/dksus.dll?lang=en&site=us&KeyWords=max19790
> > > > >
> > > > > 250MHz to 4000MHz RF Frequency Range
> > > > > Integrates Two Analog Attenuators in One Monolithic Device
> > > > > Flexible Attenuation-Control Ranges
> > > > > 22dB (per Attenuator)
> > > > > 44dB (Both Attenuators Cascaded)
> > > > > 2.4dB 1500MHz Insertion Loss (per Attenuator)
> > > > > Linear dB/V Analog Control Response Curve Simplifies Automatic Leveling Control and Gain-Trim Algorithms
> > > > > Excellent Attenuation Flatness Over Wide Frequency Ranges and Attenuation Settings
> > > > > Low 7.3mA Supply Current
> > > > > Single +5.0V Supply Voltage
> > > > >
> > > > > Lin
> > > > >
> > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > >
> > > > > > Lin,

> > > > > > Not bad for $1.71. That would work well if you used it preceding a 20-30 dB amp and could manipulate the control voltage (derived from the log detector output) so that it would be somewhere between 2.5 and 5 V when the MSA input signals are weak and a very steady value somewhere between 0.5 V and 1 V when the input reaches a level where no amplification is needed any more.
> > > > > >
> > > > > > The attenuation curve has a bit of wiggle, but if the attenuation became fixed above a certain input level, any error caused by the wiggle would not mean much since it would only affect low level signals (-105 dBm vs. -105.3 dBm is no big deal), or you could simply calibrate at small intervals.
> > > > > >
> > > > > > They don't show the effect of temperature on attenuation but they do show the effect on individual diode resistance. It seems reasonably small, especially if you are at normal room temperature or above, as the inside of the MSA would normally be.
> > > > > >
> > > > > > Sam W.
> > > > > >
> > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > >
> > > > > > > with a OPAM inverter, HSMP-3866 may work.
> > > > > > > http://www.avagotech.com/docs/AV02-1962EN
> > > > > > > Lin
> > > > > > >
> > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > >
> > > > > > > As we only working at 1013.3MHz, it may not be a difficult work to construct a PIN attenuator. Or can find a product:
> > > > > > > http://www.rflambda.com/pdf/voltageattenuator/RFVAT0102A30.pdf
> > > > > > >
> > > > > > > DIY tutorial:
> > > > > > > http://palgong.kyungpook.ac.kr/~ysyoon/Pdf/an1048.pdf
> > > > > > > http://www.odyseus.nildram.co.uk/RFMicrowave_Circuits_Files/Attenuator.pdf
> > > > > > >
> > > > > > > Lin
> > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > >
> > > > > > > It can all work as long as you don't overload anything along the way. A VGA immediately before or after the cavity filter would have to be able to handle inputs of at least -15 or -20 dBm along with the desired signal without becoming saturated in order to work well in SA mode. And have low noise. As a practical matter, I suspect you would need a small fixed gain low-noise amp followed by a VGA in order to minimize the effects of VGA noise.
> > > > > > >
> > > > > > > The expanded log detector was intended to be linear-in-db over as broad a range as possible, but because of our path calibration this linearity is not actually critical for the MSA. Any voltage-controlled mechanism would work that has high gain at low inputs and drops the gain at higher inputs, as long as the drop is not so abrupt as to require calibration at fine intervals. If would even be fine for the gain to hit its

minimum at fairly low input levels, such as -90 dBm. Something as simple as a PIN diode attenuator could work, if it has reasonable temperature stability.
> > > > > > > > >
> > > > > > > > > Sam W.
> > > > > > > > >
> > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > > > >
> > > > > > > > > > Sam
> > > > > > > > > > My calculation is very conservitive. The -120dBm input is map to the linear area -90dBm of log detector, and the noise floor of log detector is around -100dBm. i.e. the 120dBm is very decent measurement. If we just want to identify the signal above the noise floor, the calculated signal leve at MSA input should be around -128 dBm. Also, I use 1kHz RBW filter in my calculation, not 600Hz, the log detector is also the original Scotty's log detector, not the expended log detector. Your expended log detector actually contains one VGA already.
> > > > > > > > > > Here is how I calculated: The overall NF=16dB, overall gain 29. The noise floor at log detector input: -174 +16 + 29 + 30 = -99dBm. Log detector minimum input level is around -99dBm, at that area is very non-linear. However, starting from -91dBm to +15dBm, log detector has very good linearity, therefore, if we map -91dBm back to MSA input with the 29dB gain, the signal level will be -91-29=-120dBm. That does not say if we input -128dBm the log detecto won't reponse. becasue if we input -128 at MSA input, with the 29dB gain, the signal will show up at log detector as -99dBm, which is within log detector response range.
> > > > > > > > > >
> > > > > > > > > > Lin
> > > > > > > > > >
> > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > > > >
> > > > > > > > > > Lin,
> > > > > > > > > > I'm getting -120 dBm to 0 dBm now, with a fixed 7 dB amp rather than your VGA1.
> > > > > > > > > >
> > > > > > > > > > If you have a regular need to view lower signals, I think the way to go is to increase the amp gain and use a "manually-controlled attenuator"--i.e insert one when necessary to see high level signals.
> > > > > > > > > > If you rarely need the low levels, you can leave the internal amp at 7 dB, or even leave it out, but add an external amp when necessary.
> > > > > > > > > >
> > > > > > > > > > There is a little-known feature of the software called Front End Compensation, where you can specify a front end that you have added (such as an amp or attenuator) and it will use a calibration file to adjust the readings. You can use the MSA to create the calibration file. This is only needed for SA mode, since in VNA modes the regular operating calibration takes care of the front end.
> > > > > > > > > >
> > > > > > > > > > Adding attenuators or amps to the input is a way of shifting but not increasing the "simultaneous dynamic range". But it seems to me that if you get that range to 120 dB, the ability to shift it up or down with an attenuator or amp is all you are likely to need. If you have a 20 dB amp for getting to low signals, and a 20 dB attenuator (or maybe a couple), you'll be able to reach everything you want to reach.
> > > > > > > > > >

> > > > > > > > > > > One might even say that the pre-cavity amp is not all that necessary. I was just compulsive about getting a solid -120 to 0 dB range. Plus, I wanted to get an idea what type of range I would get with the SAW module, which I expect will come out in the ballpark of what I get with the pre-cavity amp.
> > > > > > > > > > >
> > > > > > > > > > > Sam W.
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > Sam
> > > > > > > > > > > This is what I was calculating this morning. Here is what I got:
> > > > > > > > > > > The MSA could have range: 0 dBm to -120dBm, with the following VGA config:
> > > > > > > > > > >
> > > > > > > > > > > For 0dBm input: 3dB pad+ mixer1+ VGA1=10dB + cavity + mixer 2+ VGA2 =0dB + IFA2 + RBW. The log detector will see power around 0dBm.
> > > > > > > > > > > For -120 dBm input: VGA1= 20dB, and VGA2=20dB.
> > > > > > > > > > >
> > > > > > > > > > > To not overload the VGA1, we may put noise filter in front of VGA1 (worst case we can put two cavity filters).
> > > > > > > > > > >
> > > > > > > > > > > The VGA may not be a real VGA, it could be a ERA-33+ Voltage controlled attenuator, if we can find one.
> > > > > > > > > > >
> > > > > > > > > > > If we extend this concept, we can put a voltage controlled attenuator at Mixer1 input. That would extend the dynamic range to +20dBm to -120dBm.
> > > > > > > > > > >
> > > > > > > > > > > Lin
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > Lin,
> > > > > > > > > > > Actually, you can let signals get to the VGA but not the log detector as long as the max gain of the VGA won't allow it to be overloaded by such stray signals. One way to make use of this would be to put a second VGA in front of the RBW filters. The IF2 amp might still be required, but with reduced gain--just enough to keep the noise level down. The second VGA could tie into the same control line as the first, and would have to have its gain limited to 20 dB or so to avoid the possibility of overload.
> > > > > > > > > > >
> > > > > > > > > > > You could do the same thing at the cavity filter, but finding a reasonably low noise VGA that operates at >1 GHz, and has enough range not to be overloaded, may be a challenge.
> > > > > > > > > > >
> > > > > > > > > > > Sam W.
> > > > > > > > > > >
> > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > > > > >
> > > > > > > > > > > Lin,

> > > > > > > > > > > > > > > A fundamental limitation of the VGA+log detector concept is that you can't allow signals to reach the VGA unless they will also reach the log detector. Otherwise, a strong signal can overload the VGA without the log detector knowing about it. That is the reason I use the arrangement RBW Filters->VGA->Noise Filter->log detector, with the Noise Filter always broader bandwidth than the RBW filter.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > You actually could violate this rule for VNA use only, as long as there would never be a spurious signal strong enough to overload the VGA. That might be the case with a VGA located after the cavity filter (maybe even before the cavity) as long as the VGA never had gain greater than 30 dB or so. (The prime overload risk would come from leaked LO1.)
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@> wrote:
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Sam
> > > > > > > > > > > > > > > If we can find a VGA working at 1013.3MHz, we might be able to apply the similar concept of the expended log detector on cavity filter amplifier. i.e. the gain is controlled with the log detector output, at hihger power input, the gain dropes more and at lower power the gain increases more. In this way, we can have larger dynamic range. The overall is a IF amplifer at 1013.3MHz but the BW is determined by the RBW filters.
> > > > > > > > > > > > > > Lin
> > > > > > > > > > > > > >
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "jghbeta" <jghalpha@> wrote:
> > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > How is the response at +21.4?
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > Jim, W1JGH
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > I have now actually installed an amp in front of my cavity filter (ERA-33 attenuated down to 7 dB gain). I'm guessing the performance of this with the cavity filter will be similar to the performance of the SAW module with its internal amp.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > I recalibrated, though my calibration is not extremely precise because I did it with my MSA upside down with the bottom off and the fan not running, so it was never at thermal equilibrium.
> > > > > > > > > > > > > >
> > > > > > > > > > > > > > > My minimum visible signal with 600 kHz RBW is -122 dBm. My goal was to get a stable signal at -120 dBm. Such signal is now very visible, and if I place a marker on it, the value varies (noise) from scan to scan by about 2 dB. As far as I am concerned, that is excellent accuracy for such a low level signal. I can actually get a

measurable response below -128 dBm, but if the ADC change per dB is too small, a small bit of noise creates a very erratic graph. So I calibrated down to -128 dBm, but I don't expect much accuracy under -120 dBm.
> > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > On the high end, I was aiming for useable but not great response at 0 dBm. I get very strong response at -5 dBm and decent response at 0 dBm, and was able to calibrate to 6 dBm with the ADC values still increasing a useful amount.
> > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > This is all in my 600 Hz RBW path. For wider paths, I lose a couple dB at the high end and varying amounts on the low end.
> > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > In summary, I have a solid response from -120 dBm to 0 dBm, with at least 5 dB of lesser response added on to each end.
> > > > > > > > > > > > > > > > >
> > > > > > > > > > > > > > > > > > Sam W.
> > > > > > > > > > > > > > > > > >
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9099. Expanded Log Detector Input Transformer

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-28 15:16:01 UTC
From: Sam
Topic: 9099 Message: 9099

The input transformer of the VGA in the Expanded Log Detector is specified as a Coilcraft type, with a Minicircuits alternate. The alternate is incorrect and should be TC16-161TG2. The one previously specified is TC16-1T, which has a lower spec of 20 MHz. If you used the TC16-1T, it should work fine but the insertion loss is a little higher, so conceivably the noise performance is a little worse.

I personally prefer Coilcraft but the Minicircuits transformers are fine.

Sam W.

9100. Re: [spectrumanalyzer] NDK 10P7D filter response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-28 18:56:31 UTC
From: Jurgen
Topic: 9093 Message: 9100

Hello Davidh,

I just bought one of these filters as well.
Could you please let me know what matching network you used.

Thanks, Jurgen

On 12/28/2011 4:48 AM, davidhooau wrote:
>
> Oh Wise Ones,
>
> I've built an RBW filter using the NDK 10P7D which is readily
> available on EBay. A happy snap is here:
>
> <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc
> <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>>
>
> Can anyone advise what the two "shoulders" 20kHz either side of the
> response might be?
>
> Thanks,
>
> davidh
>
>

9101. Re: [spectrumanalyzer] NDK 10P7D filter response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-28 19:40:54 UTC
From: Jurgen
Topic: 9093 Message: 9101

David,
Another question, in your Photo Album you show a picture called
exp_log_det_shielded.
It shows that your linear range expands pretty well up to +10dBm.
How did get there?
I seem to have difficulties getting it to 0dBm. I am using a 500kHz
noise filter.

Jurgen

On 12/28/2011 4:48 AM, davidhooau wrote:
>
> Oh Wise Ones,
>
> I've built an RBW filter using the NDK 10P7D which is readily
> available on EBay. A happy snap is here:
>
> <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc
> <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>>
>
> Can anyone advise what the two "shoulders" 20kHz either side of the
> response might be?
>
> Thanks,
>
> davidh
>
>

9102. Re: NDK 10P7D filter response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-28 22:19:36 UTC
From: davidhooau
Topic: 9093 Message: 9102

Sam,

Bingo!

I replaced the old voltage doubler with your LM2733X design, and the ripple is gone. Damned if I know why I haven't picked this up before. New photo:

<http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/1716957183/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>

Thanks!

davidh

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> David,
> My guess is that they result from modulation in your LO1 resulting from ripple on the +20V line, and have nothing to do with the filter itself. Try putting another 10 uF cap on top of the one in PLO1 and do the same for the ones on the control board in the voltage doubler. Be sure to use X5R or X7R capacitors. You might have to do the same in PLO3 as well.
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@> wrote:
> >
> > Oh Wise Ones,
> >
> > I've built an RBW filter using the NDK 10P7D which is readily available on EBay. A happy snap is here:
> >
> > <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>
> >
> > Can anyone advise what the two "shoulders" 20kHz either side of the response might be?
> >
> > Thanks,
> >
> > davidh
> >
>

9103. Re: NDK 10P7D filter response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-28 22:30:12 UTC
From: davidhooau
Topic: 9093 Message: 9103

Hi Jurgen,

I calculated 3.2uH and 70pF, but ended up using 3.8uH and 65pF, probably as my inductors were pretty low Q (~25).

I need to source some cores and learn about winding my own inductor. Any web references would be appreciated.

Cheerio,

davidh

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> Hello Davidh,
>
> I just bought one of these filters as well.
> Could you please let me know what matching network you used.
>
> Thanks, Jurgen
>
>
>
>
> On 12/28/2011 4:48 AM, davidhooau wrote:
> >
> > Oh Wise Ones,
> >
> > I've built an RBW filter using the NDK 10P7D which is readily
> > available on EBay. A happy snap is here:
> >
> > <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc
> > <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>>
> >
> > Can anyone advise what the two "shoulders" 20kHz either side of the
> > response might be?
> >
> > Thanks,
> >
> > davidh
> >
> >
>

9104. Re: [spectrumanalyzer] Re: NDK 10P7D filter response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-28 22:41:54 UTC
From: Geoff Moore
Topic: 9093 Message: 9104

Try "mini ring core calculator" by DL5SWB,
http://www.dl5swb.de/html/software_for_amateur_radio.htm , his dB
calculator is preety cool as well.

Geoff

----- Original Message -----
From: "davidhooau" <dhooke@...>
To: <spectrumanalyzer@yahoogroups.com>
Sent: Wednesday, December 28, 2011 10:30 PM
Subject: [spectrumanalyzer] Re: NDK 10P7D filter response

Hi Jurgen,

I calculated 3.2uH and 70pF, but ended up using 3.8uH and 65pF, probably as
my inductors were pretty low Q (~25).

I need to source some cores and learn about winding my own inductor. Any web
references would be appreciated.

Cheerio,

davidh

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> Hello Davidh,
>
> I just bought one of these filters as well.
> Could you please let me know what matching network you used.
>
> Thanks, Jurgen
>
>
>
>
> On 12/28/2011 4:48 AM, davidhooau wrote:
> >
> > Oh Wise Ones,
> >
> > I've built an RBW filter using the NDK 10P7D which is readily
> > available on EBay. A happy snap is here:
> >
> > <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/v
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> > <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/v
iew?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>>

> >
> > Can anyone advise what the two "shoulders" 20kHz either side of the
> > response might be?
> >
> > Thanks,
> >
> > davidh
> >
> >
>

9105. SA/VNA control bit

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-29 09:11:21 UTC
From: davidhooau
Topic: 9105 Message: 9105

Folks,

I'm building the input switch from the recent group buy. Has a logic bit been assigned to the SA/VNA switching function (SV in the schematics)? It appears that U4-bit6 is available, but is marked as "spare".

Thanks,

davidh

9106. Toroid Core References - Re: NDK 10P7D filter response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-29 10:28:27 UTC
From: lh1907
Topic: 9093 Message: 9106

Jurgen,

Checkout the "Toroid King" as a core supplier and for toroid reference info.

http://www.kitsandparts.com/toroids.php

Larry, W2HHV

--- In spectrumanalyzer@yahoogroups.com, "Geoff Moore" <m0ore@...> wrote:
>
> Try "mini ring core calculator" by DL5SWB,
> http://www.dl5swb.de/html/software_for_amateur_radio.htm , his dB
> calculator is preety cool as well.
>
> Geoff
>
> ----- Original Message -----
> From: "davidhooau" <dhooke@...>
> To: <spectrumanalyzer@yahoogroups.com>
> Sent: Wednesday, December 28, 2011 10:30 PM
> Subject: [spectrumanalyzer] Re: NDK 10P7D filter response
>
>
> Hi Jurgen,
>
> I calculated 3.2uH and 70pF, but ended up using 3.8uH and 65pF, probably as
> my inductors were pretty low Q (~25).
>
> I need to source some cores and learn about winding my own inductor. Any web
> references would be appreciated.
>
> Cheerio,
>
> davidh
>

9107. Re: NDK 10P7D filter response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-29 10:30:57 UTC
From: davidhooau
Topic: 9093 Message: 9107

Hi Jurgen,

I didn't get much over 0dBm with the VGA, maybe to +2dBm, but I'm running a really low IF2 amp gain (about 20dB) with a 3dB pad in the input mixer abd about 8dB loss in both mixer 1 and 2. I was waiting to finish some additional work before getting back to it, including extra RBW filters, the IF2 opamp stage and a pre-cavity gain stage.

I'll try to get some additional results in the next couple of weeks.

davidh

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> David,
> Another question, in your Photo Album you show a picture called
> exp_log_det_shielded.
> It shows that your linear range expands pretty well up to +10dBm.
> How did get there?
> I seem to have difficulties getting it to 0dBm. I am using a 500kHz
> noise filter.
>
> Jurgen
>
>
> On 12/28/2011 4:48 AM, davidhooau wrote:
> >
> > Oh Wise Ones,
> >
> > I've built an RBW filter using the NDK 10P7D which is readily
> > available on EBay. A happy snap is here:
> >
> > <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc
> > <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>>
> >
> > Can anyone advise what the two "shoulders" 20kHz either side of the
> > response might be?
> >
> > Thanks,
> >
> > davidh
> >
> >
>

9108. Re: [spectrumanalyzer] Re: NDK 10P7D filter response

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-29 13:28:55 UTC
From: Jurgen
Topic: 9093 Message: 9108

Thanks David,

I am in the process of lowering IF2 gain. Started out with Scotty's 38dB
amp, added one 6dB pad and did some more testing.
May add one more 6dB pad, not sure yet. Need to plot the linear range again.

Jurgen

On 12/29/2011 5:30 AM, davidhooau wrote:
>
> Hi Jurgen,
>
> I didn't get much over 0dBm with the VGA, maybe to +2dBm, but I'm
> running a really low IF2 amp gain (about 20dB) with a 3dB pad in the
> input mixer abd about 8dB loss in both mixer 1 and 2. I was waiting to
> finish some additional work before getting back to it, including extra
> RBW filters, the IF2 opamp stage and a pre-cavity gain stage.
>
> I'll try to get some additional results in the next couple of weeks.
>
> davidh
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@...> wrote:
> >
> > David,
> > Another question, in your Photo Album you show a picture called
> > exp_log_det_shielded.
> > It shows that your linear range expands pretty well up to +10dBm.
> > How did get there?
> > I seem to have difficulties getting it to 0dBm. I am using a 500kHz
> > noise filter.
> >
> > Jurgen
> >
> >
> > On 12/28/2011 4:48 AM, davidhooau wrote:
> > >
> > > Oh Wise Ones,
> > >
> > > I've built an RBW filter using the NDK 10P7D which is readily
> > > available on EBay. A happy snap is here:
> > >
> > >
> <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/view?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc

> <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/vie
w?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>
>
> > >
> <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/vie
w?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc
> <http://groups.yahoo.com/group/spectrumanalyzer/photos/album/319694121/pic/444836578/vie
w?picmode=&mode=tn&order=ordinal&start=1&count=20&dir=asc>>>
> > >
> > > Can anyone advise what the two "shoulders" 20kHz either side of the
> > > response might be?
> > >
> > > Thanks,
> > >
> > > davidh
> > >
> > >
> >
>
>

9109. Re: SA/VNA control bit

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-29 13:32:46 UTC
From: Sam
Topic: 9105 Message: 9109

David,
There is no bit assigned to control SV (switching between SA and VNA inputs). My thought is that at this point it is best done with a manual switch, for a couple of reasons. First, it is not that common to need to switch rapidly between SA and VNA, so it is not a burden to do it manually. Second, when in SA mode you don't want anything attached to Transmission and Reflection inputs, and when in VNA mode you don't want anything attached to SA input. So when you switch modes you need to mess with cabling anyway (unless you are not dealing with low level or high frequency signals so isolation is not a big deal). If you have to switch cables, flipping a switch is not a significant additional step.

Finally, there may be reasons to do unusual things, such as using Transmission for a second SA input, or using the SA input for both SA and VNA, the way we do now. With a manual switch, the software does not interfere with how you use the inputs.

There is actually no reason to use the Transmission/Reflection inputs unless you need to measure both. If you are measuring only one, it is perfectly feasible to use the SA input.

The software does operate the bit for switching between Transmission and Reflection, but for example if you use the SA input of the input switch for both SA and VNA, it's up to you to attach the appropriate cable to the SA input and the software switching of the Transmission/Reflection inputs is then irrelevant.

(Note also that at the moment the software does not gather Transmission and Reflection data in one step. You need to scan in Transmission mode, then switch to Reflection mode, or vice-versa. Even once this is combined into one button, it will require separate scans to gather each type of data.)

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "davidhooau" <dhooke@...> wrote:
>
> Folks,
>
> I'm building the input switch from the recent group buy. Has a logic bit been assigned to the SA/VNA switching function (SV in the schematics)? It appears that U4-bit6 is available, but is marked as "spare".
>
> Thanks,
>
> davidh
>

9110. Re: NDK 10P7D filter response???? VGA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-29 14:13:16 UTC
From: Sam
Topic: 9093 Message: 9110

We again have a messed up topic heading caused by starting a new thread by replying to an irrelevant one.

On the actual topic of the VGA: I think what you need to do is adjust the IF2 gain until the high end saturates about where you want it to. (It probably won't be the IF2 amp that saturates; it will likely be the VGA output.) I went for 0 dBm, because it is a nice round number. There are several factors to consider. First, in VNA mode you normally won't have inputs higher than your TG level, so any range above that point is irrelevant. That would argue for going with -5 dBm or -10 dBm. On the other hand, if you go for 0 dBm, your Mixer 1 will be experiencing increasing insertion loss, so by adding 1 dB to the VGA's high end ability you may get 2 dBm of additional high end at the MSA input, because it may take that extra 2 dB at the MSA input to increase the VGA input by 1 dB. So in a sense you get a few dB of free extra range by using the MSA input at levels that start to overload Mixer 1.

Of course, above -5 dBm or so at the MSA input, distortion in SA mode will be strong, phase measurements will be less precise, and performance over frequency will likely be somewhat different than that captured in Frequency Calibration.

Bottom line, determining the max useable high end input level is a matter of personal preference.

If you have the high end adjusted where you want it, and then decide to add the pre-cavity amp, you'll probably need to reduce the IF2 amp gain by the amount of the pre-cavity amp gain. This should still achieve some net expansion of the low end range.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, Jurgen <khj221@...> wrote:
>
> Thanks David,
>
> I am in the process of lowering IF2 gain. Started out with Scotty's 38dB
> amp, added one 6dB pad and did some more testing.
> May add one more 6dB pad, not sure yet. Need to plot the linear range again.
>
> Jurgen
>
>
>
>
> On 12/29/2011 5:30 AM, davidhooau wrote:
> >
> > Hi Jurgen,
> >
> > I didn't get much over 0dBm with the VGA, maybe to +2dBm, but I'm
> > running a really low IF2 amp gain (about 20dB) with a 3dB pad in the

> > input mixer abd about 8dB loss in both mixer 1 and 2. I was waiting to
> > finish some additional work before getting back to it, including extra
> > RBW filters, the IF2 opamp stage and a pre-cavity gain stage.
> >
> > I'll try to get some additional results in the next couple of weeks.
> >
> > davidh
> >
> > --- In spectrumanalyzer@yahoogroups.com
> > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@> wrote:
> > >
> > > David,
> > > Another question, in your Photo Album you show a picture called
> > > exp_log_det_shielded.
> > > It shows that your linear range expands pretty well up to +10dBm.
> > > How did get there?
> > > I seem to have difficulties getting it to 0dBm. I am using a 500kHz
> > > noise filter.
> > >
> > > Jurgen
> > >
> > >

9111. Re: [spectrumanalyzer] Re: NDK 10P7D filter response???? VGA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-29 14:40:14 UTC
From: Jurgen
Topic: 9093 Message: 9111

Sorry Sam, won't do it again.
Will respond under a corrected heading.

Jurgen

On 12/29/2011 9:13 AM, Sam wrote:
>
> We again have a messed up topic heading caused by starting a new
> thread by replying to an irrelevant one.
>
> On the actual topic of the VGA: I think what you need to do is adjust
> the IF2 gain until the high end saturates about where you want it to.
> (It probably won't be the IF2 amp that saturates; it will likely be
> the VGA output.) I went for 0 dBm, because it is a nice round number.
> There are several factors to consider. First, in VNA mode you normally
> won't have inputs higher than your TG level, so any range above that
> point is irrelevant. That would argue for going with -5 dBm or -10
> dBm. On the other hand, if you go for 0 dBm, your Mixer 1 will be
> experiencing increasing insertion loss, so by adding 1 dB to the VGA's
> high end ability you may get 2 dBm of additional high end at the MSA
> input, because it may take that extra 2 dB at the MSA input to
> increase the VGA input by 1 dB. So in a sense you get a few dB of free
> extra range by using the MSA input at levels that start to overload
> Mixer 1.
>
> Of course, above -5 dBm or so at the MSA input, distortion in SA mode
> will be strong, phase measurements will be less precise, and
> performance over frequency will likely be somewhat different than that
> captured in Frequency Calibration.
>
> Bottom line, determining the max useable high end input level is a
> matter of personal preference.
>
> If you have the high end adjusted where you want it, and then decide
> to add the pre-cavity amp, you'll probably need to reduce the IF2 amp
> gain by the amount of the pre-cavity amp gain. This should still
> achieve some net expansion of the low end range.
>
> Sam W.
>
> --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@...> wrote:
> >
> > Thanks David,
> >

> > I am in the process of lowering IF2 gain. Started out with Scotty's
> 38dB
> > amp, added one 6dB pad and did some more testing.
> > May add one more 6dB pad, not sure yet. Need to plot the linear
> range again.
> >
> > Jurgen
> >
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> >
> >
> > On 12/29/2011 5:30 AM, davidhooau wrote:
> > >
> > > Hi Jurgen,
> > >
> > > I didn't get much over 0dBm with the VGA, maybe to +2dBm, but I'm
> > > running a really low IF2 amp gain (about 20dB) with a 3dB pad in the
> > > input mixer abd about 8dB loss in both mixer 1 and 2. I was
> waiting to
> > > finish some additional work before getting back to it, including
> extra
> > > RBW filters, the IF2 opamp stage and a pre-cavity gain stage.
> > >
> > > I'll try to get some additional results in the next couple of weeks.
> > >
> > > davidh
> > >
> > > --- In spectrumanalyzer@yahoogroups.com
> <mailto:spectrumanalyzer%40yahoogroups.com>
> > > <mailto:spectrumanalyzer%40yahoogroups.com>, Jurgen <khj221@> wrote:
> > > >
> > > > David,
> > > > Another question, in your Photo Album you show a picture called
> > > > exp_log_det_shielded.
> > > > It shows that your linear range expands pretty well up to +10dBm.
> > > > How did get there?
> > > > I seem to have difficulties getting it to 0dBm. I am using a 500kHz
> > > > noise filter.
> > > >
> > > > Jurgen
> > > >
> > > >
>
>

9112. Pre-cavity VGA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-29 14:53:32 UTC
From: Sam
Topic: 9112 Message: 9112

I have a couple of reservations about the idea of using a VGA (such as a fixed amp + PIN attenuator) prior to the cavity filter. The main issue is that the phase shift of the VGA likely varies considerably over signal level. Crudely speaking, anything done at 1 GHz is likely to have 100 times the phase effect of the same thing done at 10 MHz. Presently, if you do Phase Calibration, you may get a few degrees of variation over signal level, until you get to fairly low signal levels. That means you may get very useable phase info without any Phase Calibration. I think with the PIN diode attenuator you may get 50 or 100 degrees of variation over signal level. This not only makes the phase info meaningless without Phase Calibration, but possibly also makes phase very sensitive to the temperature of the diodes in the attenuator.

The PIN attenuator or other VGA mechanism might not be as effective if placed before or after the IF2 amp, but at least there it would operate at 10.7 MHz where the phase effects would be far smaller.

Ideally, the PIN attenuator control would cause it to reach max attenuation somewhere below -90 dBm, where precise phase measurements are normally not possible anyway.

Finally, any amp prior to the RBW filters must be able to handle strong signals outside the RBW at minimum attenuation/max gain, because the log detector will be unaware of such signals and therefore its output may remain low and it will not be increasing attenuation/reducing gain in order to deal with the strong signals. This limits the max feasible pre-RBW gain.

Sam W.

9113. Re: Pre-cavity VGA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-29 16:12:32 UTC
From: inlinebeginner
Topic: 9112 Message: 9113

Sam
I put a phase measurement over the range here:
http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/714983641/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc

The phase variation over -11dB to -22dB (Vctrl 0.5V to 2.0V) is about 28 degree.
Lin

--- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@...> wrote:
>
> I have a couple of reservations about the idea of using a VGA (such as a fixed amp + PIN attenuator) prior to the cavity filter. The main issue is that the phase shift of the VGA likely varies considerably over signal level. Crudely speaking, anything done at 1 GHz is likely to have 100 times the phase effect of the same thing done at 10 MHz. Presently, if you do Phase Calibration, you may get a few degrees of variation over signal level, until you get to fairly low signal levels. That means you may get very useable phase info without any Phase Calibration. I think with the PIN diode attenuator you may get 50 or 100 degrees of variation over signal level. This not only makes the phase info meaningless without Phase Calibration, but possibly also makes phase very sensitive to the temperature of the diodes in the attenuator.
>
> The PIN attenuator or other VGA mechanism might not be as effective if placed before or after the IF2 amp, but at least there it would operate at 10.7 MHz where the phase effects would be far smaller.
>
> Ideally, the PIN attenuator control would cause it to reach max attenuation somewhere below -90 dBm, where precise phase measurements are normally not possible anyway.
>
> Finally, any amp prior to the RBW filters must be able to handle strong signals outside the RBW at minimum attenuation/max gain, because the log detector will be unaware of such signals and therefore its output may remain low and it will not be increasing attenuation/reducing gain in order to deal with the strong signals. This limits the max feasible pre-RBW gain.
>
> Sam W.
>

9114. Re: Pre-cavity VGA

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-29 17:01:13 UTC
From: inlinebeginner
Topic: 9112 Message: 9114

Instead of put pre-cavity VGA, we may want to put a preCavity AMP + 1bit switchable attenuator to shift the orginal MSA V-dBm curve 10dB down for weak signal test. That would double the calibration work.
I was wondering if we can design a auto calibration tool to do the calibrion. Every 1 year we may need to recalibrate the MSA, that might be the time we just forget how to do the calibration. If we can automate the calibrition, it would be nice.
Lin

--- In spectrumanalyzer@yahoogroups.com, "inlinebeginner" <inlinebeginner@...> wrote:
>
> Sam
> I put a phase measurement over the range here:
> http://groups.yahoo.com/group/spectrumanalyzer/photos/album/608125393/pic/714983641/view?picmode=&mode=tn&order=ordinal&start=81&count=20&dir=asc
>
> The phase variation over -11dB to -22dB (Vctrl 0.5V to 2.0V) is about 28 degree.
> Lin
>
> --- In spectrumanalyzer@yahoogroups.com, "Sam" <swetterlin@> wrote:
> >
> > I have a couple of reservations about the idea of using a VGA (such as a fixed amp + PIN attenuator) prior to the cavity filter. The main issue is that the phase shift of the VGA likely varies considerably over signal level. Crudely speaking, anything done at 1 GHz is likely to have 100 times the phase effect of the same thing done at 10 MHz. Presently, if you do Phase Calibration, you may get a few degrees of variation over signal level, until you get to fairly low signal levels. That means you may get very useable phase info without any Phase Calibration. I think with the PIN diode attenuator you may get 50 or 100 degrees of variation over signal level. This not only makes the phase info meaningless without Phase Calibration, but possibly also makes phase very sensitive to the temperature of the diodes in the attenuator.
> >
> > The PIN attenuator or other VGA mechanism might not be as effective if placed before or after the IF2 amp, but at least there it would operate at 10.7 MHz where the phase effects would be far smaller.
> >
> > Ideally, the PIN attenuator control would cause it to reach max attenuation somewhere below -90 dBm, where precise phase measurements are normally not possible anyway.
> >
> > Finally, any amp prior to the RBW filters must be able to handle strong signals outside the RBW at minimum attenuation/max gain, because the log detector will be unaware of such signals and therefore its output may remain low and it will not be increasing attenuation/reducing gain in order to deal with the strong signals. This limits the max feasible pre-RBW gain.
> >
> > Sam W.

> >
>

9115. SAW 1013 MHz Filter Group Buy-Parts Ordered

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-29 21:43:41 UTC
From: nealmartini
Topic: 9115 Message: 9115

All Buyers,

Thanks everyone for the prompt PayPal payments. I received payments from all but a few of the participants.

The PCBs and SAWs have been ordered. The turnaround time for the PCBs will be quick, but the SAW leadtime is quoted as 5-6 weeks. Be patient! I will keep everyone informed as things progress.

Neal

9116. RE: [spectrumanalyzer] SAW 1013 MHz Filter Group Buy-Parts Ordered

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-29 22:18:43 UTC
From: F4CNY
Topic: 9115 Message: 9116

Neal,

Thank you for this super work !!

Ennio

-----Message d'origine-----
De : spectrumanalyzer@yahoogroups.com
[mailto:spectrumanalyzer@yahoogroups.com]De la part de nealmartini
Envoy? : jeudi 29 d?cembre 2011 22:44
? : spectrumanalyzer@yahoogroups.com
Objet : [spectrumanalyzer] SAW 1013 MHz Filter Group Buy-Parts Ordered

All Buyers,

Thanks everyone for the prompt PayPal payments. I received payments from all but a few of the participants.

The PCBs and SAWs have been ordered. The turnaround time for the PCBs will be quick, but the SAW leadtime is quoted as 5-6 weeks. Be patient! I will keep everyone informed as things progress.

Neal

9117. Simple Photos

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-30 11:15:48 UTC
From: Sam
Topic: 9117 Message: 9117

In order to get good closeup photos of circuit boards, I have used a fancy digital camera with a macro lens, but I still don't get good depth of field. So I tried photos with my IPad 2, which normally takes very clear pictures. However, it is a bit "far-sighted" so if you take pictures of something only a few inches away the fine details can be very fuzzy. That far-sightedness is the reason most cameras require a macro lens for extreme closeups.

I have a very cheap magnifying glass, about 2" in diameter, that has a small area of extra magnification near the handle. I held that over the IPad lens while taking the picture (tight against the IPad body), and the results were amazingly good. See attached photos, one with and one without the magnifier. The black towers in upper right and lower left are jumpers, which project out toward the camera about 1/4" but still come out clear.

I'm sure the same thing could be done with a phone camera. I intend to buy a stronger magnifier, or maybe powerful reading glasses (+1.25 glasses had little effect). And to figure out how to hold the IPad a bit steadier.

I did this in the middle of the night. I woke up with this idea and had to try it out.

Sam W.

9118. RE: [spectrumanalyzer] Simple Photos

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-30 12:05:53 UTC
From: marc olanié
Topic: 9117 Message: 9118

>In order to get good closeup photos of circuit boards, I have used a fancy digital camera with a macro lens,

Hi Sam

If you want to take high def macro picture with a infinite field depth, there is a nice technique called □light scanning photomicrography□. You must generate a very thin □line□ of white light (a dia projector with a □slotted□ cache made with old razor lames), a sliding support and a camera able to take a picture with an □infinite aperture time□ . Results are fantastic

http://sebaw.online.fr/eng/technique.htm

http://comiti.com/

There is another trick to have high def pictures of pcb□s : the scanner. If you have a flat bed scanner, you just have to put your board on the front glass and scan it. It□s a cheap □macro□ engine. Depending on the quality of your scanner, you can have a higher def than any macro lens ;-)

My 2 cts

Marc

9119. Re: Simple Photos

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-30 12:53:59 UTC
From: Tim W4YN
Topic: 9117 Message: 9119

I have done really nice close ups with inexpensive Cannon and Fuji pocket cameras. I have very high dollar Nikon's with several macro lenses if needed but these cameras are very convienent to have in shack verses large SLR and heavy lense's. I did not pay more than $99 for either of the small cameras. The auto focus when set to macro also worked very well. I did not need flash just average room light.
I did adjust white balance for available room lights,IE, flurescent in shop. Depending on lighting arrangement you may need some supplemental light if your head and camera blocks available light.
Tim W4YN

--- In spectrumanalyzer@yahoogroups.com, marc olanié <Marc.olanie@...> wrote:
>
> >In order to get good closeup photos of circuit boards, I have used a fancy
> digital camera with a macro lens,
>
>
>
>
>
> Hi Sam
>
>
>
> If you want to take high def macro picture with a infinite field depth,
> there is a nice technique called "light scanning photomicrography". You must
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> cache made with old razor lames), a sliding support and a camera able to
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> your scanner, you can have a higher def than any macro lens ;-)
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>
> My 2 cts
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>
>
> Marc
>

9120. Slim-adc or slim-pdm power supply ?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-30 14:02:54 UTC
From: marc olanié
Topic: 9120 Message: 9120

Hi
Two options can help to have a better phase accuracy. The firt one, described at

http://www.scottyspectrumanalyzer.com/slim_ADC_16.html

paragraph "Optional Power Modification to SLIM-ADC-16...

uses the 5 Vcc delivered by the PDM

BUT...

MOD 4 chapter of the Slim PDM says the opposite, and ask to add the 5V regulator to the ADC and use it to power only U5 of the pdm

redo from start, cyclic redundancy error, same player shoot again :- D

Which is the "best solution" ? I would say the second one, looking @ modification's date, but I need to be shure

Thanks

Marc

9121. Re: Slim-adc or slim-pdm power supply ?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-30 17:13:02 UTC
From: Sam
Topic: 9120 Message: 9121

Whichever is most convenient is the way to go. The important thing is that the ADC and the final flip-flop in the PDM have the same power supply. There was a bit of discussion of this recently, so you might search the messages.

I used the ADC supply to power the final PDM flip-flop, which also requires cutting a trace to separate that IC from the PDM supply.
Sam W.

--- In spectrumanalyzer@yahoogroups.com, marc olanié <Marc.olanie@...> wrote:
>
> Hi
> Two options can help to have a better phase accuracy. The firt one,
> described at
>
> http://www.scottyspectrumanalyzer.com/slim_ADC_16.html
>
> paragraph "Optional Power Modification to SLIM-ADC-16...
>
> uses the 5 Vcc delivered by the PDM
>
> BUT...
>
> MOD 4 chapter of the Slim PDM says the opposite, and ask to add the 5V
> regulator to the ADC and use it to power only U5 of the pdm
>
> redo from start, cyclic redundancy error, same player shoot again :- D
>
>
> Which is the "best solution" ? I would say the second one, looking @
> modification's date, but I need to be shure
>
>
> Thanks
>
> Marc
>

9122. Re: Simple Photos

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-30 17:31:16 UTC
From: Sam
Topic: 9117 Message: 9122

The thing I like about using the iPad or phone is you can email the pictures to yourself or someone else, or put them in DropBox, without hooking to your PC or using a flash card as an intermediate step. For about $15 you can buy an assortment of 4X-12X magnifiers, so I may give that a try. (Large magnification may be nice, though I suspect it gets you back to limited depth of field.)

BTW, I have an inexpensive scanner that produces beautiful scans, but has very limited depth of field so it doesn't work well for circuit boards (except bare ones). Plus, I don't use it a lot so when I do I have to dig it out of the closet and hook it up.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Tim W4YN" <w4yn@...> wrote:
>
> I have done really nice close ups with inexpensive Cannon and Fuji pocket cameras. I have very high dollar Nikon's with several macro lenses if needed but these cameras are very convienent to have in shack verses large SLR and heavy lense's. I did not pay more than $99 for either of the small cameras. The auto focus when set to macro also worked very well. I did not need flash just average room light.
> I did adjust white balance for available room lights,IE, flurescent in shop. Depending on lighting arrangement you may need some supplemental light if your head and camera blocks available light.
> Tim W4YN
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> > your scanner, you can have a higher def than any macro lens ;-)
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> > My 2 cts
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> >
> >
> > Marc
> >
>

9123. RE: [spectrumanalyzer] Re: Slim-adc or slim-pdm power supply ?

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-30 17:36:20 UTC
From: marc olanié
Topic: 9120 Message: 9123

>Whichever is most convenient is the way to go. The important thing is that the ADC and the final flip-flop in the PDM have the same power supply. There was a bit of discussion of this recently, so you might search the messages.
>
>I used the ADC supply to power the final PDM flip-flop, which also requires cutting a trace to separate that IC from the PDM supply.

Thank you, Sam. I think I'll follow your "way of build"

Season's greetings
Marc

9124. Re: [spectrumanalyzer] Simple Photos

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-30 21:09:47 UTC
From: Dave
Topic: 9117 Message: 9124

I recently got a webcam (C910). I found that if I use the zoom, it takes quite good circuit board pictures.

Dave - WB6DHW
<http://wb6dhw.com>

9125. Re: [spectrumanalyzer] Simple Photos

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-30 21:18:49 UTC
From: Jurgen
Topic: 9117 Message: 9125

Does anyone have a recommendation which camera to buy for good PCB shots?

Jurgen

On 12/30/2011 4:09 PM, Dave wrote:
>
> I recently got a webcam (C910). I found that if I use the zoom, it
> takes quite good circuit board pictures.
>
> Dave - WB6DHW
> <http://wb6dhw.com>
>
>

9126. Re: Re: [spectrumanalyzer] Simple Photos

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-30 21:50:25 UTC
From: David McGough
Topic: 9117 Message: 9126

I use a Panasonic Lumix dmc-fz50, with a simple screw-on close up lens and tripod. This combo works fantasically well! This camera is now outdated and is more pricey than some other possible options, however, it has taken thousands of great photos for me! Note that a tripod *really* helps when wanting to get close, clear detail.

See a sample photo of the bottom of a GE Rangr VCO board at:
http://12.17.28.4/~kb4fxc/rangr/Rangr89-6m-conversion/photos/p1010200.jpg

73, David KB4FXC

On Fri, 30 Dec 2011, Jurgen wrote:

> Does anyone have a recommendation which camera to buy for good PCB shots?
>
> Jurgen
>
>
> On 12/30/2011 4:09 PM, Dave wrote:
> >
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> > takes quite good circuit board pictures.
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>

9127. Re: [spectrumanalyzer] Simple Photos

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-30 21:59:58 UTC
From: Dan Andersson
Topic: 9117 Message: 9127

Jurgen,

A cheap USB microscope from Ebay will do nicely.

I'm also using it when soldering smd's manually.

I paid 25 odd U$ or so. I think it can do 100x.

I uploaded some photos taken as a demo to the group photo's in the new M0DFI folder.

Theres a close up, medium range and well from above. The microscope do well as a webcam.

//Dan, M0DFI

On Fri, 30 Dec 2011 16:18:49 -0500
Jurgen <khj221@...> wrote:

> Does anyone have a recommendation which camera to buy for good PCB shots?
>
> Jurgen
>
>
> On 12/30/2011 4:09 PM, Dave wrote:
> >
> > I recently got a webcam (C910). I found that if I use the zoom, it
> > takes quite good circuit board pictures.
> >
> > Dave - WB6DHW
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> >

9128. Re: [spectrumanalyzer] Simple Photos

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-31 03:51:00 UTC
From: Jim Hontoria
Topic: 9117 Message: 9128

And here is my contribution to the subject:

I use a regular digital camera in the telefoto setting were you get
maximum depth of field to avoid having to worry about the focus.
I also use a USB cheap digital microscope for inspection with about x80
magnification. It's amazing to see the images on a 17" monitor full screen.

Jim

On Fri, Dec 30, 2011 at 4:59 PM, Dan Andersson <dan@...> wrote:

> **
>
>
>
> Jurgen,
>
> A cheap USB microscope from Ebay will do nicely.
>
> I'm also using it when soldering smd's manually.
>
> I paid 25 odd U$ or so. I think it can do 100x.
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> //Dan, M0DFI
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>
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> > >
> > >
>
>
>

--
Jim G. Hontoria

9129. Re: Simple Photos

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-31 04:15:17 UTC
From: alanh137@cableone.net
Topic: 9117 Message: 9129

Another technique that could be used is called focus stacking. I haven't tried it, but keep saying I'm going to experiment a bit.

The idea is that you take three photos, one with the foreground in focus, one with the middle in focus, and one with the background in focus, then post-process the three photos with software.

There is a wikipedia article here
http://en.wikipedia.org/wiki/Focus_stacking

There are even some electronic gadgets you can build to help. One is here
http://www.circuitsathome.com/camera-control/focus-stacking-assistant-for-eos-cameras

Apparently the site owner uses the technique to take a lot of the photos on the site.

9130. Re: [spectrumanalyzer] Simple Photos

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-31 04:33:59 UTC
From: william sprowls
Topic: 9117 Message: 9130

And as a follow up. Jim used that USB microscope camera with Skype and I could see everything from 2000 miles away.
Maybe this is how Santa "knows".
Scotty

--- On Fri, 12/30/11, Jim Hontoria <jghalpha@...> wrote:

From: Jim Hontoria <jghalpha@...>
Subject: Re: [spectrumanalyzer] Simple Photos
To: spectrumanalyzer@yahoogroups.com
Date: Friday, December 30, 2011, 9:51 PM

And here is my contribution to the subject: I use a regular digital camera in the telefoto setting were you get maximum depth of field to avoid having to worry about the focus. I also use a USB cheap digital microscope for inspection with about x80 magnification. It's amazing to see the images on a 17" monitor full screen.

 Jim

On Fri, Dec 30, 2011 at 4:59 PM, Dan Andersson <dan@...> wrote:

Jurgen,

A cheap USB microscope from Ebay will do nicely.

I'm also using it when soldering smd's manually.

I paid 25 odd U$ or so. I think it can do 100x.

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Theres a close up, medium range and well from above. The microscope do well as a webcam.

//Dan, M0DFI

On Fri, 30 Dec 2011 16:18:49 -0500

Jurgen <khj221@...> wrote:

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> Jurgen

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>

> On 12/30/2011 4:09 PM, Dave wrote:

> >

> > I recently got a webcam (C910). I found that if I use the zoom, it

> > takes quite good circuit board pictures.

> >

> > Dave - WB6DHW

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> >

> >

--
Jim G. Hontoria

9131. Re: [spectrumanalyzer] Re: Simple Photos

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-31 08:11:37 UTC
From: Dan Andersson
Topic: 9117 Message: 9131

"Taking photo's of PCB"?

What are your intention with the photo's? Advertizing on house wall sized billboards.
Or married to an article in a magazine or just a pesonal archiving matter...

You don't really need a 1.8 Giga Pixel camera unless you intend to spot PCB's in a pocket of a Taliba :)
Nor do you ned a 10-15 MP camera for an article in a radio/electronics magazine.

I guess my USB camera gives me a minimum of 640x320 but I suspect I get 1024x768 pixels out of it.

The USB camera pictures are good enough for the article but not for the wall ad.

It's not just a case of my usual Saturday morning grumpiness but I just wanted to higlight the
difficulty on giving you a good answer to your question.

I mean - yes, I'd like a Hasselblad 200,000 MP camera but it would be wasted on what I do.
PCB pictures in HD? Nahhh!

//Cheers

Dan, M0DFI

On Sat, 31 Dec 2011 04:15:17 -0000
alanh137@... wrote:

> Another technique that could be used is called focus stacking. I haven't tried it, but keep saying I'm going to experiment a bit.
>
> The idea is that you take three photos, one with the foreground in focus, one with the middle in focus, and one with the background in focus, then post-process the three photos with software.
>
> There is a wikipedia article here
> http://en.wikipedia.org/wiki/Focus_stacking
>
> There are even some electronic gadgets you can build to help. One is here
> http://www.circuitsathome.com/camera-control/focus-stacking-assistant-for-eos-cameras
>
> Apparently the site owner uses the technique to take a lot of the photos on the site.
>
>

9132. building the video filter SLIM

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-31 16:29:38 UTC
From: Geoff
Topic: 9132 Message: 9132

I am about to upgrade the software from an early version of 116 to the latest version that incorporates the USB facility and software controlled switches.

I would at the same time, install the software controlled video filter selection SLIM.

Has there been a group buy for this SLIM pcb that I missed or is it combined with another group of pcb's ?

Looking at the schematic, it appears that connection to the ADC board is via a single coax for each of the magnitude and phase lines. The original, which I have, used capacitors on the ADC pcb and an external switch.

How is the new pcb connected, I can only imagine that a SMA tee is used to connect the new pcb coax to the existing.

My final question (at this time) concerns a possible typo in the notes associated on the video filter schematic rev B , 1/10/2011, which says that the larger filter caps have series caps to avoid damage on power down. Should these be series resistors ?

Hope you all have a successful 2012, and all your projects work first time.

Geoff

9133. Re: building the video filter SLIM

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-31 19:30:25 UTC
From: Sam
Topic: 9132 Message: 9133

Geoff,
It was included in a group buy of a larger board some time ago. There were some errors in that PCB that were communicated to the participants.

The video filter switch connects to the ADC board with a single wire for each of mag and phase. Coax is also fine. The switch just appends a grounded capacitor to the end of the line, so no thru connection is needed.

You are correct that the large capacitors have series resistors, not caps. This is to limit current discharge through improper paths on power off; whether they are actually necessary is anybody's guess. I have actually reduced my resistor values to 22 ohms, though I'm not sure that provides any advantage over 47 ohms.

Be sure to run the Configuration Manager to tell the MSA that you have implemented the automated video switch.

Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Geoff" <m0ore@...> wrote:
>
> I am about to upgrade the software from an early version of 116 to the latest version that incorporates the USB facility and software controlled switches.
>
> I would at the same time, install the software controlled video filter selection SLIM.
>
> Has there been a group buy for this SLIM pcb that I missed or is it combined with another group of pcb's ?
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> Looking at the schematic, it appears that connection to the ADC board is via a single coax for each of the magnitude and phase lines. The original, which I have, used capacitors on the ADC pcb and an external switch.
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>
> Hope you all have a successful 2012, and all your projects work first time.
>
> Geoff
>

9134. Re: [spectrumanalyzer] Re: building the video filter SLIM

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-31 23:01:11 UTC
From: Geoff Moore
Topic: 9132 Message: 9134

Sam,

Thanks for the very prompt response, looking at the schematics of both the video filter switch and the ADC, I think I could connect the centre of the coax connectors on the switch board to the connector on the ADC that I am currently using for the centre pole of the manual switch.

Next, I don't suppose that anyone has a spare board that contains the video switch pcb they can part with.

Geoff

----- Original Message -----
From: "Sam" <swetterlin@...>
To: <spectrumanalyzer@yahoogroups.com>
Sent: Saturday, December 31, 2011 7:30 PM
Subject: [spectrumanalyzer] Re: building the video filter SLIM

Geoff,
It was included in a group buy of a larger board some time ago. There were some errors in that PCB that were communicated to the participants.

The video filter switch connects to the ADC board with a single wire for each of mag and phase. Coax is also fine. The switch just appends a grounded capacitor to the end of the line, so no thru connection is needed.

You are correct that the large capacitors have series resistors, not caps. This is to limit current discharge through improper paths on power off; whether they are actually necessary is anybody's guess. I have actually reduced my resistor values to 22 ohms, though I'm not sure that provides any advantage over 47 ohms.

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Sam W.

--- In spectrumanalyzer@yahoogroups.com, "Geoff" <m0ore@...> wrote:
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> I am about to upgrade the software from an early version of 116 to the
> latest version that incorporates the USB facility and software controlled
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> I would at the same time, install the software controlled video filter
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> down. Should these be series resistors ?
>
> Hope you all have a successful 2012, and all your projects work first
> time.
>
> Geoff
>

9135. Re: Simple Photos

Yahoo group: spectrumanalyzer (2011)
Date: 2011-12-31 23:41:58 UTC
From: spyker49
Topic: 9117 Message: 9135

I use a cheap x400 USB "Microcapture" with manual focus.
Only occasionally I need to add an external light source (flashlight) to read those tiny SMD ID codes. Great at finding solder bridges or not well soldered pads.
Len Spyker

--- In spectrumanalyzer@yahoogroups.com, william sprowls <wsprowls@...> wrote:
>
> And as a follow up. Jim used that USB microscope camera with Skype and I could see everything from 2000 miles away.
> Maybe this is how Santa "knows".
> Scotty